Air Quality Monitoring

Alberta Environment

Near three residences in the Fort Saskatchewan area

August 2001- August 2002

Summary

Volunteers trained by Alberta Environment collected air samples near residences in the Fort Saskatchewan area between August 23, 2001 and August 20, 2002. A total of 38 samples were collected over this time period at three residences located close to industrial facilities. These samples were analyzed for 158 chemicals referred to as volatile organic compounds (VOCs). The purpose of the survey was to collect samples in response to odour complaints from residents in the vicinity of the industries located in the Fort Saskatchewan area.

The results of the monitoring survey showed that concentrations of the majority of VOCs collected at all sites were low. VOC concentrations were below applicable Alberta Ambient Air Quality Guidelines in all samples. However, the following air quality issues were identified based on the 38 air samples collected:

(1) Low odour thresholds were exceeded for acetaldehyde in 31 of 38 samples and for ethanol in two of 38 samples. These chemicals may have been detected as odours at times when these samples were collected. Although low odour thresholds for acetaldehyde were exceeded, the levels detected were below Alberta Ambient Air Quality guidelines for acetaldehyde.

(2) Ontario's Point of Impingement Limit for 1,2 dichloroethane was exceeded in four samples. There is no Alberta Ambient Air Quality Guideline for 1,2 dicholoroethane.

(3) VOC levels in the Fort Saskatchewan survey were generally similar to or lower than levels measured in Calgary and Edmonton (based on 2001 data). However, twenty-five out of the 158 compounds recorded higher levels in the Fort Saskatchewan survey. With the exception of 1,2 dichloroethane, none of these compounds exceeded Alberta Ambient Air Quality Guidelines or Ontario Point of Impingement Limits.

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Background

Volatile Organic Compounds (VOCs)

There are natural and man-made sources of VOCs. Natural sources of VOCs are forests, grasslands and swamps. Major man-made sources of VOCs in the outdoor environment are automobile emissions, and emissions from industries such as petroleum and chemical industries and natural gas combustion. Organic compounds such as benzene are also emitted by indoor sources such as tobacco smoke, glues, paint, furniture wax and detergents. Industries in the Fort Saskatchewan area are a source of a variety of VOCs. A listing of industries in the Fort Saskatchewan area, of which some report emissions to Environment Canada's National Pollutant Release Inventory (NPRI), is included in the appendix to this report. The associated emissions reported to the NPRI can be obtained at http://www.ec.gc.ca/pdb/npri/npri_home_e.cfm.

Alberta Ambient Air Quality Guidelines

Alberta's Ambient Air Quality Guidelines[1] are established under Section 14 of the Environmental Protection and Enhancement Act (EPEA). EPEA provides for the development of guidelines and ambient environmental quality objectives for Alberta. The Ambient Air Quality Guidelines are used for:

- reporting on the state of the atmospheric environment in Alberta.
- reporting to Albertans on the quality of air through an air quality index (AQI).
- establishing approval conditions for regulated industrial facilities.
- evaluating proposals to construct facilities that will have air emissions.
- guiding special ambient air quality surveys.
- assessing compliance near major industrial air emission sources.

Alberta's Ambient Air Quality Guidelines for one-hour concentrations of VOCs measured in this survey are listed in Table 1.

Table 1: Alberta's Ambient Air Quality Guidelines for VOCs measured in the Fort Saskatchewan area.

VOC	One-hour Guideline ($\mu g/m^3$)
Acetaldehyde	90
Benzene	30
Styrene	215
Vinyl Chloride	130

1 *Alberta Ambient Air Quality Guidelines*. Alberta Environment. February 2000.

The Ontario Point of Impingement (POI) Limits

In the absence of a guideline in Alberta, the Ontario Point of Impingement (POI) Limits were used for comparison with ambient air concentrations. The Point of Impingement is defined by the Ontario Ministry of Environment as: "Any point on the ground or on a receptor, such as nearby buildings, located outside the company's property boundaries at which the highest concentration of a contaminant caused by the aggregate emission of that contaminant from a facility is expected to occur"[2]. In Ontario, the POI is used in the regulatory permitting process: predicted maximum POI concentrations obtained from dispersion modelling are compared with the corresponding half-hour POI Limit. Ontario POI Limits do not have regulatory standing in Alberta and are used for comparison purposes only. The applicable half-hour POI Limits for Ontario are listed in Tables I-IV in the appendix.

Odour Thresholds

The odour thresholds provided as a reference point are the low and high odour thresholds as found in the literature[3,4]. The range of low odour thresholds to high odour thresholds varies widely. This is due to the wide variation in threshold definition, sample presentation, panel selection, purity of chemicals used and data interpretation[3]. Sense of smell results must be a statistical average due to biological variability. The thresholds normally used are those for 50% and for 100% of the odour panel[5]. The low odour threshold is the level at which a human can detect an odour, but not necessarily recognize the particular chemical causing the odour. The high odour threshold is the highest reported odour threshold. An exceedance of the odour threshold does not necessarily imply an adverse effect on human health.

Monitoring Method

Sampling of VOC's occurred at three residential locations. Volunteers trained by Alberta Environment collected 38 samples, 30 of these samples were collected near Location A, five were collected near Location B and three were collected near Location C. These samples were collected for 24-hour, 1-hour and 1-minute (grab samples) time periods using 6 litre Silco Steel canisters. Samples were analyzed for 158 volatile organic compounds. Figure 1 and Table 2 provide details of the sampling location, collection frequency and method. The Environment Canada Environmental Technology Centre in Ottawa conducted the sample analysis.

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2 *Ontario Minister of the Environment*. 1998. Procedure for Preparing an Emission Summary and Dispersion Modelling Report.

3 *Ruth, J.H.* 1986. Odour thresholds and irritation levels of several chemical substances: A review. (Am. Ind. Hyg. Assoc. J. 47).

4 3M 2001. 3M 2001 Respirator Selection Guide.

5 Verschueren. 1996. Handbook of Environmental Data on Organic Chemicals. 3rd Edition

Figure 1: Map of the monitoring locations in relation to selected industrial facilities

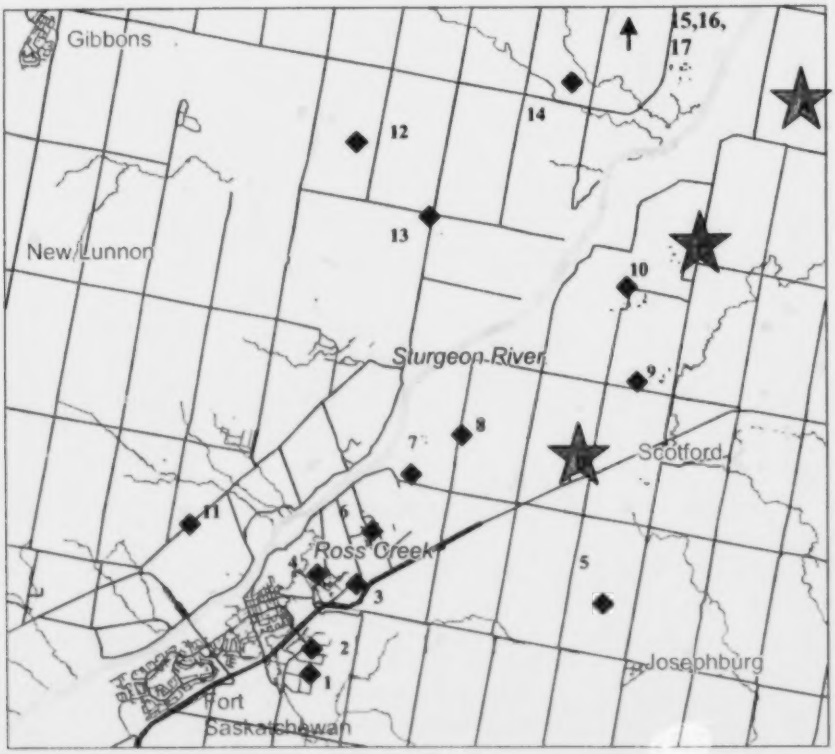
Please note that the following is NOT a complete listing of all facilities in the area. Some were omitted to avoid crowding of the map. Please refer to Figure D in the Appendix for a map of facilities northeast of Edmonton.

A, B, C monitoring locations
1 Marsulex Inc. - Customer Service
2 Guardian Chemicals
3 Marsulex - Sulphides
4 The Cobalt Refinery Company
5 Nexen Chemicals Canada Ltd
6 Dow Chemicals Canada
7 Chevron Canada Resources
8 BP Canada Energy
9 Oxy Vinyls Canada Inc
10 Shell Chemicals - Scotford
11 Can Amera Foods
12 Agrium Products
13 Westairn Corp
14 Degussa Canada
15 Agrium Products - Redwater
16 Newalta - Redwater
17 Imperial Oil Resources Ltd

Table 2: Summary of sampling dates, methods and locations for the Fort Saskatchewan area residence VOC survey.

DATE	LOCATION	NUMBER OF SAMPLES COLLECTED	METHOD
Aug 27, 2001	Location A	1	Canister grab
Nov 17, 2001	Location A	1	Canister 1-h
Mar 27 to Jul 25, 2002	Location A	22	Canister 24-h
Jul 27 and 31, 2002	Location A	1	Canister 48-h
Aug 6 to Aug 30, 2002	Location A	5	Canister 24-h
Aug 23, Aug 25, Nov 5, 2001	Location B	3	Canister grab
Oct 2, Nov 2, 2001	Location B	2	Canister 1-h
Sep 13, 2001	Location C	1	Canister grab
Oct 23, Nov 29, 2001	Location C	2	Canister 1-h

Figure 1: Map of the monitoring locations in relation to selected industrial facilities



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Aug 6 to Aug 30, 2002	Location A	5	Canister 24-h
Aug 23, Aug 25, Nov 5, 2001	Location B	3	Canister grab
Oct 2, Nov 2, 2001	Location B	2	Canister 1-h
Sep 13, 2001	Location C	1	Canister grab
Oct 23, Nov 29, 2001	Location C	2	Canister 1-h

Results

Concentrations of the majority of VOCs collected at all sites were low. VOC concentrations were below applicable Alberta Ambient Air Quality Guidelines in all samples. Ontario's Point of Impingement Limit was exceeded for 1,2 dichloroethane in four samples. Low odour thresholds were exceeded for acetaldehyde in 31 of 38 samples and for ethanol in two of 38 samples. Please refer to Tables I-IV in the appendix for the complete data set.

A comparison of VOC levels from the Fort Saskatchewan sampling locations with Edmonton East, Edmonton Central and Calgary Central data from the year 2001 showed that VOC levels were generally similar or lower in Fort Saskatchewan than levels experienced in Calgary and Edmonton. Based on the 158 compounds measured, 133 compounds were measured at similar or lower levels at the Fort Saskatchewan monitoring locations in comparison to Edmonton and Calgary data. Higher 24-hour concentrations were measured at the Fort Saskatchewan survey locations for the following twenty-five compounds:

- 1,2-dichloroethane,
- 1-undecene,
- 2-methylbutane,
- acetaldehyde,
- acetone,
- a-Pinene,
- b-Pinene,
- c-2 heptene,
- c-3 heptene,
- camphene,
- chlorobenzene,
- chloroethane,
- ethanol,
- ethylene oxide,
- hexachlorobutadiene,
- isoprene,
- limonene,
- methyl alcohol,
- methyl-t-butyl ether,
- propene,
- propyne,
- t-2-octene,
- tert-butylbenzene,
- undecane, and
- vinyl chloride

With the exception of 1,2 dichloroethane, none of the compounds listed above exceeded Alberta Ambient Air Quality Guidelines or Ontario Point of Impingement Limits. Please refer to Table V in the appendix for a comparison of the Fort Saskatchewan average 24-hour data to the Edmonton and Calgary year 2001 data.

There is a range of variability of low odour thresholds to high odour thresholds for all compounds. Although low odour thresholds for acetaldehyde were exceeded, levels remained well below one-hour Alberta Ambient Air Quality guidelines.

In Table 3 sampling locations, dates, and compounds, which exceeded applicable guidelines or low odour thresholds, were related to the wind direction and wind speed for information purposes. Data collected was for preliminary investigation of odour complaints and is not suitable for source apportionment.

Table 3: Wind speed and direction on sampling days in relation to compounds that exceeded applicable guidelines or low odour thresholds.

Wind speed and direction on sampling days in relation to compounds, which exceeded applicable guidelines or low odour thresholds							
Location	Sampling Date	Sample Type	VOCs [µg/m³]*			Wind Information	
			1,2 Dichloroethane	Acetaldehyde	Ethanol*	Direction	Speed (km/h)
B	08/23/01	Grab	*10.800*	*1.120*	1.240	S	7
	08/25/01	Grab	*18.480*	*6.200*	15.680	SW	8
A	08/27/01	Grab	bd	*4.960*	1.800	S	1
C	09/13/01	Grab	0.880	*23.360*	*4107.08***	NW	2
B	10/02/01	1-hour	*14.280*	0.160	8.840	SW	8
C	10/23/01	1-hour	0.020	*no data*	no data	E	7 to 8
D	11/02/01	1-hour	*11.818*	*no data*	no data	SW	9 to 10
	11/05/01	Grab	0.024	*no data*	no data	W	5.8
A	11/17/01	1-hour	0.034	*no data*	no data	W	16 to 17
C	11/29/01	1-hour	0.033	*no data*	no data	W	8 to 9
A	3/27/02	24-hour	0.056	*4.617*	22.358	W	1 to 47
	4/2/02	24-hour	0.042	*2.384*	2.609	NW-N-SE	1 to 12
	4/8/02	24-hour	0.100	*5.813*	7.950	SE-NW	0 to 12
	4/14/02	24-hour	0.042	*3.179*	14.348	E-NE	2 to 23
	4/21/02	24-hour	0.042	*10.120*	32.240	NE-SE	3 to 14
	4/27/02	24-hour	0.040	*2.920*	23.040	NE-SE	2 to 16
	5/2/02	24-hour	0.058	*4.260*	30.680	SSW-NW	5 to 25
	5/8/02	24-hour	0.452	*3.660*	21.960	SE-NW	1 to 8
	5/14/02	24-hour	0.038	*3.912*	34.931	NE-W	3 to 29
	5/17/02	24-hour	0.044	*bd*	*bd*	SSE	2 to 27
	5/20/02	24-hour	0.034	*4.921*	38.748	SE-NE	1 to 21
	5/26/02	24-hour	0.130	*3.233*	31.006	SSW-W	4 to 14
	06/01/02	24-hour	0.048	*4.429*	33.333	NNW-W	6 to 21
	06/06/02	24-hour	0.033	*13.256*	50.764	W-NE	5 to 15
	06/13/02	24-hour	0.239	*7.709*	68.116	SSW-NNE	1 to 16
	06/19/02	24-hour	0.971	*11.819*	63.942	SW-NW	3 to 21
	06/25/02	24-hour	0.099	*12.138*	111.588	NNE thru S to NW	1 to 13
	07/01/02	24-hour	0.026	*7.271*	86.588	W	7 to 22
	07/07/02	24-hour	0.027	*7.578*	54.641	NW-SE	0 to 17
	07/13/02	24-hour	0.019	*10.980*	85.986	SSW-NNE	1 to 16
	07/19/02	24-hour	0.067	*7.738*	58.691	SW-NW	3 to 21
	07/25/02	24-hour	0.176	*32.634*	*484.600*	NNE thru S to NW	1 to 13
	27&31-Jul-02	48-hour	0.019	*13.462*	147.522	W-WNW	4 to 20
	6-Aug-02	24-hour	0.068	*24.400*	74.476	NE-NW-SSW	0 to 8
	12-Aug-02	24-hour	0.146	*10.868*	82.486	SSW-WNW	3 to 13
	18-Aug-02	24-hour	0.036	*20.473*	69.767	S-W	4 to 12
	24-Aug-02	24-hour	0.480	*8.617*	133.020	NE – W	1 to 8
	30-Aug-02	24-hour	0.016	*5.089*	86.507	SW -N	0 to 22
Applicable Guidelines			POI= 6 µg/m³ LOT=24000 µg/m³	AAAQG = 90 µg/m³ LOT= 0.2 µg/m³	POI= 19000 µg/m³ LOT= 342 µg/m³		

AAAQG = Alberta Ambient Air Quality Guideline (one-hour) POI= Point of Impingement LOT= Low Odour Threshold bd = below detection limit

* exceedances in italics

**The ethanol concentration for the 13-Sep-01 sample (FS #1865) was higher than the top range of the GC column

Appendix

Table I: Fort Saskatchewan Incident Canister Sampling (August 23 to November 29, 2001) Concentration (µg/m^3)

Fort Saskatchewan Incident Canister Sampling (August 23 to November 29, 2001) Concentration (µg/m^3)													
Location	B		A	C	B	C	D		A	C	Alberta One-hour Guideline* (µg/m^3)	Ontario Half-hour Point of Impingement Limit* (µg/m^3)	Odour Threshold Range† (µg/m^3)	
Sampling Date	08/23/01	08/25/01	08/27/01	09/13/01	10/02/01	10/23/01	11/02/01	11/05/01	11/17/01	11/29/01				
Sample Type	Grab	Grab	Grab	Grab	1-hour	1-hour	1-hour	Grab	1-hour	1-hour				
Compound Name	Concentration (µg/m^3)												Low	High
1,1,1-Trichloroethane	0.880	0.900	1.080	4.080	0.180	0.414	0.217	0.189	0.267	0.386		350000	122139	
1,1,2,2-Tetrachloroethane	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd			21000	35000
1,1,2-Trichloroethane	bd	bd	bd	bd	bd	bd	0.049	bd	bd	bd				
1,1-Dichloroethane	0.440	0.240	bd	bd	0.120	bd	0.260	bd	bd	bd		600	891536	
1,1-Dichloroethene	bd	bd	bd	bd	bd	bd	0.066	bd	bd	bd		30		
1,2,3-Trimethylbenzene	bd	1.080	bd	0.320	0.280	0.009	0.054	bd	0.016	0.006				
1,2,4-Trichlorobenzene	bd	bd	bd	bd	bd	0.010	bd	0.007	0.018	0.014		100	24000	24000
1,2,4-Trimethylbenzene	0.200	3.520	bd	1.120	1.160	0.035	0.184	0.011	0.058	0.022		500		
1,2-Dibromoethane (EDB)	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd		9	76800	76800
1,2-Dichlorobenzene	bd	bd	bd	bd	bd	bd	bd	bd	bd	0.006		37000	12000	300000
1,2-Dichloroethane	10.800	18.480	bd	0.880	14.250	0.020	11.818	0.024	0.034	0.033		6	24000	440000
1,2-Dichloropropane	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd		2400	1167	606666
1,2-Diethylbenzene	bd	0.380	bd	bd	0.200	bd	bd	bd	bd	bd				
1,3,5-Trimethylbenzene	0.080	1.640	bd	0.240	0.400	0.012	0.067	bd	0.020	0.006				
1,3-Butadiene	bd	0.720	bd	1.240	0.560	0.023	0.120	0.007	0.012	0.013			352	2880
1,3-Dichlorobenzene	bd	bd	bd	bd	bd	bd	bd	bd	bd	0.006				
1,3-Diethylbenzene	bd	0.440	bd	0.120	0.080	0.009	0.014	bd	bd	bd				
1,4-Dichlorobenzene	bd	bd	bd	0.320	0.040	0.018	0.021	bd	0.019	0.016		285	288	
1,4-Dichlorobutane	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
1,4-Diethylbenzene	bd	1.160	bd	0.320	0.200	bd	0.035	bd	bd	bd				
1-Butene/2-Methylpropene	0.440	1.400	0.600	2.600	2.080	0.740	0.474	0.291	0.488	0.452				
1-Butyne	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
1-Decene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd		180000		
1-Heptene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
1-Hexene/2-Methyl-1-Pentene	bd	0.960	bd	0.280	bd	0.050	0.047	bd	bd	bd				
1-Methylcyclohexene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
1-Methylcyclopentene	bd	bd	bd	bd	bd	bd	0.009	bd	bd	bd				
1-Nonene	bd	bd	bd	0.560	bd	0.027	bd	bd	bd	bd				
1-Octene	bd	2.640	bd	bd	bd	0.114	0.767	bd	bd	bd		150000		
1-Pentene	bd	0.720	bd	bd	bd	bd	0.061	bd	0.030	0.025				
1-Undecene	bd	bd	bd	bd	bd	bd	bd	bd	bd	0.108				
2,2,3-Trimethylbutane	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
2,2,4-Trimethylpentane	bd	11.360	bd	1.000	2.360	0.142	1.395	bd	0.058	0.031				
2,2,5-Trimethylhexane	bd	0.320	bd	bd	bd	0.020	0.023	bd	0.009	0.010				
2,2-Dimethylbutane	bd	0.440	bd	bd	bd	bd	0.081	bd	0.042	0.020				
2,2-Dimethylhexane	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
2,2-Dimethylpentane	bd	bd	bd	bd	bd	bd	bd	bd	bd	0.008				
2,2-Dimethylpropane	bd	bd	bd	bd	bd	bd	bd	bd	bd	0.015				
2,3,4-Trimethylpentane	bd	2.600	bd	0.320	0.680	0.031	0.287	bd	bd	0.022				
2,3-Dimethylbutane	bd	2.000	bd	0.200	0.520	0.026	0.166	0.012	0.062	0.033				
2,3-Dimethylpentane	bd	6.120	bd	bd	1.280	0.096	0.422	0.014	0.072	0.048				
2,4-Dimethylhexane	bd	1.240	bd	bd	0.320	bd	0.172	bd	0.020	0.010				
2,4-Dimethylpentane	bd	3.400	bd	0.200	0.520	0.020	0.157	bd	0.029	0.014				
2,5-Dimethylhexane	bd	0.880	bd	bd	0.160	bd	0.126	bd	bd	0.008				
2-Ethyl-1-Butene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
2-Ethyltoluene	0.080	0.880	bd	0.200	0.240	0.010	0.052	bd	0.016	0.008				
2-Methyl-1-Butene	bd	bd	bd	bd	0.280	bd	0.131	0.022	0.068	0.034				
2-Methyl-2-Butene	bd	0.600	bd	0.320	0.320	0.039	0.114	0.034	0.128	0.072				
2-Methylbutane	0.680	17.120	1.980	2.720	7.440	0.573	2.768	0.172	0.729	0.558				
2-Methylheptane	bd	1.320	bd	0.320	0.360	bd	0.127	bd	bd	0.010				
2-Methylhexane	bd	1.480	bd	0.560	1.000	0.099	0.445	bd	0.083	0.044				
2-Methylpentane	bd	4.000	bd	1.000	2.160	0.070	0.508	0.046	0.177	0.104				
3,6-Dimethyloctane	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				

*Alberta Ambient Air Quality Guidelines, Alberta Environment, February 2000 †Summary of Point of Impingement Standards, Point of Impingement Guidelines, and Ambient Air Quality Criteria, Ontario Ministry of the Environment, September 2001

‡Odour thresholds from the 1986 paper entitled "Odor Thresholds and Irritation Levels of Several Chemical substances: A review" published by the American Industrial Hygiene Association and the "3M 2001 Respirator Selection Guide" available at www.3m.com

bd Below Detection Limit

Table I: continued

Fort Saskatchewan Incident Canister Sampling (August 23 to November 29, 2001) Concentration (µg/m³)														
Location	B		A	C	B	C	B		A	C	Alberta One-hour Guideline[a] (µg/m³)	Ontario Half-hour Point of Impingement Limit[b] (µg/m³)	Odour Threshold Range[c] (µg/m³)	
Sampling Date	8/23/01	8/23/01	8/27/01	9/13/01	10/2/01	10/23/01	11/2/01	11/5/01	11/17/01	11/29/01				
Sample Type	Grab	Grab	Grab	Grab	1-hour	1-hour	1-hour	Grab	1-hour	1-hour				
Compound Name	Concentration (µg/m³)												Low	High
3-Ethyltoluene	0.120	1.800	bd	0.400	0.520	0.018	0.114	0.008	0.036	0.014				
3-Methyl-1-Butene	bd	bd	bd	bd	0.080	0.013	0.026	bd	bd	bd				
3-Methyl-1-Pentene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
3-Methylheptane	bd	0.760	bd	0.200	0.200	bd	0.133	bd	bd	0.009				
3-Methylhexane	bd	1.920	bd	0.560	1.040	0.172	0.494	bd	0.068	0.049				
3-Methylpentane	bd	2.520	bd	0.640	1.360	0.076	0.453	0.050	0.160	0.086				
4-Ethyltoluene	0.120	1.080	bd	0.200	0.280	0.008	0.048	bd	0.014	0.007				
4-Methyl-1-Pentene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
4-Methylheptane	bd	0.560	bd	bd	0.040	bd	0.046	bd	bd	bd				
Acetaldehyde	1.120	8.200	4.900	23.360	0.160	no data	no data	no data	no data	no data	90		0.2	4140
Acetone	0.760	2.840	1.240	41.360	2.000	no data	no data	no data	no data	no data		48000	47466.6	1613860
Acetylene	0.398	8.190	0.841	1.681	1.875	0.262	1.362	0.316	0.525	no data		56000	657200	
a-Pinene	bd	bd	bd	0.200	0.480	bd	0.043	bd	0.026	0.005				
Benzene	0.480	2.640	0.320	5.760	1.440	0.230	0.660	0.142	0.285	0.354	30		4500	270000
Benzyl Chloride	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd			235	1550
b-Pinene	bd	bd	bd	bd	bd	bd	bd	bd	0.008	bd				
Bromodichloromethane	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
Bromoform	bd	bd	bd	bd	bd	0.024	0.020	0.016	0.027	0.023		165	5300000	
Bromomethane	bd	bd	bd	0.120	bd	0.051	0.061	0.047	0.083	0.052		4000		
Bromotrichloromethane	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
Butane	1.200	32.600	2.440	8.200	19.800	0.699	9.680	0.720	1.781	1.140			2850	14630
c-1,2-Dichloroethene	bd	bd	bd	bd	0.120	bd	0.131	bd	bd	bd		315		
c-1,2-Dimethylcyclohexane	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
c-1,3-Dichloropropene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
c-1,3-Dimethylcyclohexane	bd	1.160	bd	0.440	0.240	0.012	0.054	bd	bd	0.011				
c-1,4/t-1,3-Dimethylcyclohexane	bd	bd	bd	0.120	bd	bd	bd	bd	bd	bd				
c-2-Butene	bd	bd	bd	0.240	0.160	bd	0.055	bd	0.016	bd				
c-2-Heptene	bd	bd	bd	bd	bd	bd	0.108	0.056	bd	0.058				
c-2-Hexene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
c-2-Pentene	bd	0.360	bd	bd	bd	bd	bd	bd	0.028	bd				
c-3-Heptene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
c-3-Methyl-2-Pentene	bd	bd	bd	bd	bd	bd	bd	bd	0.015	bd				
c-4-Methyl-2-Pentene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
Camphene	bd	bd	bd	bd	bd	bd	bd	bd	0.044	0.006				
Carbontetrachloride	0.960	1.200	0.600	0.600	1.280	0.607	2.363	0.559	0.810	0.622		7.2	60000	128400
Chlorobenzene	bd	bd	bd	0.160	bd	bd	bd	bd	0.010	0.008		4200	980	280000
Chloroethane	2.360	1.200	bd	bd	0.960	0.038	1.885	0.013	0.024	0.015				
Chloroform	2.560	1.080	0.280	0.560	0.920	0.068	2.143	0.054	0.074	0.078		300	250000	1000000
Chloromethane	1.240	1.200	1.360	3.280	1.240	1.057	1.006	0.972	1.482	1.034		20000		
Cyclohexane	bd	1.320	bd	0.520	0.400	0.052	0.138	0.027	0.047	0.063		300000	1435	
Cyclohexene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
Cyclopentane	bd	0.920	bd	0.400	0.600	bd	0.137	0.020	0.061	0.044				
Cyclopentene	bd	0.240	bd	0.080	0.040	0.010	0.013	bd	bd	bd				
Decane	0.160	5.920	bd	0.320	0.760	0.039	0.131	0.026	0.042	0.030				
Dibromochloromethane	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
Dibromomethane	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
Dichloromethane	0.320	5.400	0.600	1.400	0.480	0.348	0.651	0.137	0.234	0.226		5300	540000	2160000
Dodecane	bd	2.880	bd	1.960	0.640	0.199	0.158	0.033	0.150	0.070				
Ethane	4.946	26.538	11.342	6.466	8.000	2.954	14.918	3.272	2.700	no data			184500	1105770
Ethanol	1.240	15.680	1.800	4107.08*	8.840	no data	no data	no data	no data	no data		19000	342	9690000
Ethylbenzene	0.200	1.120	0.200	0.840	0.800	0.050	0.320	0.018	0.071	0.042		3000	8700	870000
Ethylbromide	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd			890000	
Ethylene	8.020	42.669	2.565	5.415	6.637	0.877	18.870	0.313	0.403	no data			299000	4600000
Ethylene Oxide	bd	bd	bd	0.520	bd	no data	no data	no data	no data	no data		15	520000	1400000

[a] Alberta Ambient Air Quality Guidelines. Alberta Environment. February 2000.
[b] Summary of Point of Impingement Standards, Point of Impingement Guidelines, and Ambient Air Quality Criteria. Ontario Minister of the Environment. September 2001.
[c] Odour thresholds from the 1968 paper entitled "Odor Thresholds and Irritation Levels of Several Chemical substances: A review" published by the American Industrial Hygiene Association and the "3M 2001 Respirator Selection Guide" available at www.3m.com.

bd Below Detection Limit

*The ethanol concentration for the 13-Sep-01 sample was higher than the top range of the GC column.

Table I: continued

Fort Saskatchewan Incident Canister Sampling (August 23 to November 29, 2001) Concentration (µg/m³)														
Location	B		A	C	B	C	B		A	C	Alberta One-hour Guideline[a] (µg/m³)	Ontario Half-hour Point of Impingement Limit[b] (µg/m³)	Odour Threshold Range[c] (µg/m³)	
Sampling Date	8/23/01	8/25/01	8/27/01	9/13/01	10/2/01	10/23/01	11/2/01	11/5/01	11/17/01	11/29/01				
Sample Type	Grab	Grab	Grab	Grab	1-hour	1-hour	1-hour	Grab	1-hour	1-hour				
Compound Name	Concentration (µg/m³)												Low	High
Freon 11	1.520	1.600	1.480	1.880	1.280	1.680	1.536	1.486	2.161	1.669		18000	28000	1170400
Freon 113	0.640	0.680	0.800	0.520	0.400	0.624	0.568	0.572	0.816	0.587		2400000	342000	1026000
Freon 114	0.320	bd	bd	0.200	bd	0.144	0.131	0.134	0.193	0.133		2100000		
Freon 12	2.560	3.920	2.640	4.960	2.720	2.808	2.676	2.645	3.716	2.721		1500000		
Freon 22	0.800	0.760	0.560	0.760	0.720	0.520	0.567	0.488	0.675	0.496		1050000		
Heptane	bd	3.120	bd	0.840	1.320	0.113	0.491	0.040	0.078	0.067		33000	200000	1280000
Hexachlorobutadiene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd			12000	
Hexane	0.600	3.240	bd	1.120	1.640	0.102	0.460	0.056	0.096	0.132		35000	77141	
Hexylbenzene	bd	bd	bd	bd	bd	0.015	bd	bd	bd	0.007				
Ibdan	0.080	0.360	bd	0.200	0.080	bd	0.023	bd	bd	bd				
Isobutane	0.560	8.720	1.280	21.840	9.640	0.515	3.029	0.279	0.556	1.379				
Iso-Butylbenzene	bd	0.120	bd	bd	bd	bd	bd	bd	bd	bd				
Isoprene	bd	0.920	1.880	4.600	0.160	0.079	0.089	0.017	0.034	0.036				
Iso-Propylbenzene	bd	0.440	bd	0.040	0.080	bd	0.016	bd	0.006	bd		100		
Limonene	bd	bd	bd	1.000	bd	0.037	0.048	bd	0.036	0.006				
m,p-Xylene	0.440	5.640	0.360	2.240	3.080	0.116	1.006	0.038	0.193	0.074		2300	348	174000
Methyl Alcohol	101.720	29.200	8.760	56.200	27.800	no data	no data	no data	no data	no data		12000		
Methylcyclohexane	bd	3.040	1.160	0.520	0.680	0.114	0.227	0.032	0.052	0.070			2000000	
Methylcyclopentane	bd	1.880	bd	0.680	1.160	0.057	0.402	0.030	0.098	0.070				
Methyl-t-Butyl Ether (MTBE)	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd		2200		
Naphthalene	0.320	0.760	bd	1.280	0.280	0.025	0.076	0.017	0.078	0.019		36	1500	125000
n-Butylbenzene	bd	0.360	bd	bd	bd	bd	0.011	bd	bd	bd				
Nonane	bd	9.560	bd	0.360	1.120	0.039	0.135	0.029	0.037	0.027			3412500	3412500
n-Propylbenzene	bd	0.680	bd	0.160	0.200	0.010	0.044	bd	0.017	0.009				
Octane	bd	3.120	bd	0.720	0.640	0.052	0.238	0.022	0.046	0.034		45400	725000	1208330
o-Xylene	0.200	2.360	0.160	0.840	1.080	0.032	0.310	0.014	0.065	0.029			3693	
p-Cymene	bd	0.680	bd	bd	bd	bd	bd	bd	bd	bd				
Pentane	0.640	6.280	0.920	bd	4.640	bd	5.990	0.234	0.420	0.421			6600	3000000
Propane	1.720	15.120	4.520	21.280	27.680	1.482	9.541	1.775	2.066	3.455			1800000	36000000
Propene	0.160	3.280	0.175	4.480	3.200	0.319	1.065	0.068	0.110	0.128				
Propyne	bd	0.520	bd	0.440	0.200	bd	0.122	bd	0.016	0.027				
sec-Butylbenzene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
Styrene	bd	0.280	bd	0.640	0.320	bd	0.108	bd	bd	0.009	215	400	202	860000
t-1,2-Dichloroethene	0.760	0.360	bd	bd	0.280	bd	0.534	bd	bd	bd				
t-1,2-Dimethylcyclohexane	bd	bd	bd	0.280	bd	bd	bd	bd	bd	bd				
t-1,3-Dichloropropene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
t-1,4-Dimethylcyclohexane	bd	0.560	bd	0.080	0.040	0.007	0.023	bd	bd	0.006				
t-2-Butene	bd	bd	bd	0.480	bd	0.012	0.049	bd	0.015	bd				
t-2-Heptene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
t-2-Hexene	bd	bd	bd	bd	bd	bd	0.021	bd	bd	bd				
t-2-Octene	bd	bd	bd	bd	bd	bd	0.118	bd	bd	bd				
t-2-Pentene	bd	bd	bd	bd	bd	bd	0.114	bd	0.055	bd				
t-3-Heptene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
t-3-Methyl-2-Pentene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
t-4-Methyl-2-Pentene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
tert-Butylbenzene	bd	bd	bd	bd	bd	0.062	bd	bd	bd	0.014				
Tetrachloroethene	bd	0.240	bd	0.400	0.240	0.025	0.137	0.020	0.035	0.038		10000		
Toluene	1.000	5.800	0.720	7.120	3.920	0.238	1.602	0.090	0.294	0.240		2000	8025	150000
Trichloroethene	0.200	0.160	bd	bd	0.240	0.019	0.199	0.018	0.031	0.026		3500		
Ubdecane	bd	3.320	0.400	0.520	0.560	0.068	0.154	0.024	0.054	0.029				
Vinylchloride	0.920	0.960	bd	0.200	1.320	bd	0.633	bd	bd	bd	130	3	646	

[a] Alberta Ambient Air Quality Guidelines. Alberta Environment. February 2000

[b] Summary of Point of Impingement Standards, Point of Impingement Guidelines, and Ambient Air Quality Criteria. Ontario Ministry of the Environment. September 2001

[c] Odour thresholds from the 1995 paper entitled "Odor Thresholds and Irritation Levels of Several Chemical substances: A review" published by the American Industrial Hygiene Association and the "3M 2001 Respirator Selection Guide" available at www.3m.com

bd Below Detection Limit

Table II: Fort Saskatchewan Incident Canister Sampling (March 27 to May 26, 2002) Concentration (µg/m^3)

Fort Saskatchewan Incident Canister Sampling (March 27 to May 26, 2002) Concentration (µg/m^3)															
Location	A												Alberta One-hour Guideline* (µg/m^3)	Ontario Half-hour Point of Impingement Limit* (µg/m^3)	Odour Threshold Range* (µg/m^3)	
Sampling Date	3/27/02	4/2/02	4/8/02	4/14/02	4/21/02	4/27/02	5/2/02	5/8/02	5/14/02	5/17/02	5/20/02	5/26/02				
Sample Type	24-hour															
Compound Name	Concentration (µg/m^3)														Low	High
1,1,1-Trichloroethane	0.214	0.210	0.210	0.208	0.208	0.212	0.206	0.216	0.208	0.336	0.206	0.214		350000	122139	
1,1,2,2-Tetrachloroethane	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd			21000	35000
1,1,2-Trichloroethane	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
1,1-Dichloroethane	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd		600	891536	
1,1-Dichloroethene	0.006	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd		30		
1,2,3-Trimethylbenzene	0.078	0.010	0.016	0.018	0.010	0.010	0.008	0.030	0.014	0.020	0.018	0.018				
1,2,4-Trichlorobenzene	0.028	0.018	0.026	0.018	0.008	0.008	0.004	0.004	0.020	0.016	0.018	0.004		100	24000	24000
1,2,4-Trimethylbenzene	0.272	0.038	0.048	0.048	0.038	0.032	0.028	0.108	0.040	0.052	0.038	0.056		500		
1,2-Dibromoethane (EDB)	bd	0.004	0.006	bd	0.002	bd	bd	bd	bd	bd	bd	bd		9	76800	76800
1,2-Dichlorobenzene	0.010	0.008	0.010	0.006	0.004	0.002	0.002	0.002	0.008	0.020	0.006	0.002		37000	12000	300000
1,2-Dichloroethane	0.056	0.042	0.100	0.042	0.042	0.040	0.058	0.452	0.038	0.044	0.034	0.130		6	24000	440000
1,2-Dichloropropane	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd		2400	1167	606666
1,2-Diethylbenzene	bd	bd	bd	0.002	bd	bd	bd	0.004	0.002	bd	0.002	bd				
1,3,5-Trimethylbenzene	0.058	0.010	0.012	0.010	0.008	0.008	0.006	0.032	0.008	0.016	0.008	0.014				
1,3-Butadiene	0.018	0.018	0.022	0.004	0.004	0.004	0.004	0.036	0.012	0.004	0.098	0.012			352	2860
1,3-Dichlorobenzene	0.012	0.008	0.010	0.008	0.004	0.002	0.002	0.002	0.008	0.008	0.006	0.002				
1,3-Diethylbenzene	bd	0.004	0.008	bd	0.004	bd	bd	0.008	bd	0.008	0.002	0.008				
1,4-Dichlorobenzene	0.024	0.010	0.014	0.012	0.010	0.010	0.008	0.016	0.012	0.012	0.012	0.014		285	288	
1,4-Dichlorobutane	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
1,4-Diethylbenzene	bd	bd	bd	bd	0.014	bd	bd	bd	bd	bd	0.016	bd				
1-Butene/2-Methylpropene	0.740	0.850	0.884	0.594	0.760	0.530	0.066	0.148	0.094	0.132	0.228	0.086				
1-Butyne	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	0.010	bd				
1-Decene	0.026	bd	bd	bd	0.014	bd	bd	bd	bd	0.016	0.024	bd		180000		
1-Heptene	bd	bd	0.038	bd	bd	0.026	bd	bd	0.052	bd	0.062	bd				
1-Hexene/2-Methyl-1-Pentene	0.058	bd	0.040	0.026	bd	0.020	bd	bd	bd	bd	0.048	bd				
1-Methylcyclohexene	0.020	bd	bd	bd	0.008	bd	bd	bd	bd	bd	bd	bd				
1-Methylcyclopentene	0.072	0.010	0.012	0.004	0.012	0.002	bd	0.008	0.002	0.004	0.002	0.004				
1-Nonene	bd	bd	0.040	0.028	0.034	0.038	0.028	bd	0.036	0.072	0.048	bd				
1-Octene	bd	bd	bd	0.028	bd	bd	bd	bd	bd	bd	bd	bd		150000		
1-Pentene	0.054	0.026	0.054	0.028	0.034	0.024	0.026	0.070	0.030	0.048	0.070	0.062				
1-Ubdecene	0.270	0.044	bd	0.188	0.042	2.472	0.806	0.874	bd	bd	bd	bd				
2,2,3-Trimethylbutane	bd	bd	bd	bd	bd	bd	bd	0.004	bd	bd	bd	bd				
2,2,4-Trimethylpentane	0.148	bd	0.064	0.028	0.018	bd	0.032	0.284	bd	bd	0.010	0.136				
2,2,5-Trimethylhexane	bd	bd	bd	0.004	0.006	bd	0.002	0.008	bd	bd	bd	0.004				
2,2-Dimethylbutane	0.112	0.020	0.050	0.016	0.026	0.008	0.014	0.054	0.014	0.008	0.012	0.038				
2,2-Dimethylhexane	bd	bd	bd	bd	0.002	bd	bd	bd	bd	bd	bd	bd				
2,2-Dimethylpentane	0.012	0.008	0.014	0.008	0.008	bd	0.006	0.014	0.006	bdb	0.006	0.008				
2,2-Dimethylpropane	bd	bd	0.026	0.018	0.014	0.010	0.010	0.022	0.018	0.008	0.012	0.012				
2,3,4-Trimethylpentane	0.048	0.014	0.022	0.010	bd	bd	0.014	0.068	bd	0.016	bd	0.038				
2,3-Dimethylbutane	0.090	0.036	0.062	0.036	0.028	0.016	0.034	0.140	0.042	0.020	0.032	0.088				
2,3-Dimethylpentane	0.202	0.032	0.118	0.044	0.064	0.018	0.040	0.218	0.040	0.032	0.036	0.108				
2,4-Dimethylhexane	0.034	0.008	0.022	0.008	bd	0.004	0.006	0.032	0.008	bd	0.006	0.018				
2,4-Dimethylpentane	0.104	0.020	0.054	0.018	bd	0.008	0.024	0.110	0.026	bd	0.026	0.056				
2,5-Dimethylhexane	0.020	0.006	0.014	0.014	0.008	0.004	0.006	0.026	0.010	bd	0.008	0.016				
2-Ethyl-1-Butene	bd	bd	bd	bd	bd	bd	bd	bd	0.016	0.016	0.020	0.032				
2-Ethyltoluene	0.044	0.008	0.012	0.010	0.008	0.006	0.006	0.028	0.008	0.012	0.012	0.014				
2-Methyl-1-Butene	0.100	0.068	0.070	0.052	0.054	0.046	0.016	0.064	0.016	0.032	0.028	0.046				
2-Methyl-2-Butene	0.154	0.104	0.108	0.084	0.094	0.076	0.012	0.044	0.012	0.032	0.012	0.034				
2-Methylbutane	1.508	0.526	1.540	0.854	0.724	0.374	0.838	2.712	1.304	0.488	0.908	1.790				
2-Methylheptane	bd	0.020	bd	bd	bd	bd	bd	0.044	bd	0.044	0.016	0.026				
2-Methylhexane	0.184	0.056	0.114	0.046	0.048	bd	0.038	0.162	bd	0.044	0.044	0.094				
2-Methylpentane	0.376	0.150	0.302	0.124	0.130	0.054	0.112	0.432	0.168	0.080	0.126	0.296				
3,6-Dimethyloctane	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				

*Alberta Ambient Air Quality Guidelines. Alberta Environment. February 2000. *Summary of Point of Impingement Standards, Point of Impingement Guidelines, and Ambient Air Quality Criteria. Ontario Ministor of the Environment. September 2001

*Odour thresholds from the 1986 paper entitled "Odor Thresholds and Irritation Levels of Several Chemical substances: A review" published by the American Industrial Hygiene Association and the "3M 2001 Respirator Selection Guide" available at www.3m.com.

bd Below Detection Limit

Table II: continued

Fort Saskatchewan Incident Canister Sampling (March 27 to May 26, 2002) Concentration (µg/m³)															
Location	A												Alberta One-hour Guideline[a] (µg/m³)	Ontario Half-hour Point of Impingement Limit[b] (µg/m³)	Odour Threshold Range[c] (µg/m³)	
Sampling Date	3/27/02	4/2/02	4/8/02	4/14/02	4/21/02	4/27/02	5/2/02	5/8/02	5/14/02	5/17/02	5/20/02	5/26/02				
Sample Type	24-hour															
Compound Name	Concentration (µg/m³)														Low	High
3-Ethyltoluene	0.094	0.020	0.022	0.018	0.012	0.010	0.012	0.058	0.012	0.024	0.018	0.026				
3-Methyl-1-Butene	bd	0.008	0.010	0.008	0.006	0.006	0.006	0.026	0.008	0.008	0.022	0.018				
3-Methyl-1-Pentene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
3-Methylheptane	0.126	0.026	bd	0.034	0.058	bd	bd	0.062	bd	0.108	bd	0.048				
3-Methylhexane	0.176	0.068	0.112	bd	0.068	bd	bd	0.166	0.056	0.080	0.048	0.096				
3-Methylpentane	0.314	0.126	0.208	0.118	0.162	0.062	0.108	0.388	0.144	0.082	0.114	0.282				
4-Ethyltoluene	0.052	0.012	0.014	0.010	0.008	0.006	0.008	0.024	0.008	0.012	0.010	0.012				
4-Methyl-1-Pentene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
4-Methylheptane	bd	0.008	bd	bd	bd	bd	bd	0.016	bd	bd	0.008	0.010				
Acetaldehyde	4.617	2.384	5.813	3.179	10.120	2.920	4.260	3.660	3.912	bd	4.921	3.233	90		0.2	4140
Acetone	bd	bd	bd	bd	3.580	1.900	1.880	2.200	2.065	bd	2.647	3.077		48000	47466.6	1613860
Acetylene	0.580	0.490	0.575	0.367	0.430	0.418	0.880	1.150	0.258	0.245	0.781	0.321		58000	657200	
a-Pinene	bd	bd	bd	bd	bd	0.034	0.020	0.054	0.102	0.048	0.148	0.036				
Benzene	0.636	0.510	0.568	0.304	0.326	0.328	0.244	0.732	0.236	0.172	0.906	0.604	30		4500	270000
Benzyl Chloride	bd	bd	bd	bd	0.004	bd	bd	bd	0.008	bd	bd	bd			235	1550
b-Pinene	bd	bd	bd	0.030	bd	0.030	bd	bd	bd	0.012	bd	0.018				
Bromodichloromethane	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
Bromoform	0.008	0.012	0.016	0.014	0.008	0.012	0.012	0.014	0.010	0.012	0.010	0.010		165	5300000	
Bromomethane	0.068	0.062	0.070	0.068	0.070	0.068	0.080	0.058	0.064	0.064	0.068	0.064		4000		
Bromotrichloromethane	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
Butane	3.034	1.368	2.504	1.524	1.488	0.556	1.676	3.732	1.646	1.016	1.596	2.398			2850	14630
c-1,2-Dichloroethene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd		315		
c-1,2-Dimethylcyclohexane	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
c-1,3-Dichloropropene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
c-1,3-Dimethylcyclohexane	0.022	0.010	0.024	0.018	0.014	bd	0.010	0.036	0.024	0.008	0.020	0.020				
c-1,4/t-1,3-Dimethylcyclohexane	bd	bd	0.010	0.004	bd	bd	bd	0.012	bd	bd	0.008	0.008				
c-2-Butene	0.029	0.026	0.018	0.008	0.014	0.008	0.010	0.028	0.008	0.028	0.012	0.016				
c-2-Heptene	0.238	bd	bd	0.164	0.202	bd	0.058	0.046	bd	bd	0.084	bd				
c-2-Hexene	0.014	0.006	0.006	bd	bd	bd	bd	bd	bd	bd	bd	bd				
c-2-Pentene	0.038	0.012	0.014	0.006	0.010	0.004	bd	0.028	bd	0.020	bd	0.018				
c-3-Heptene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
c-3-Methyl-2-Pentene	0.038	0.028	0.018	bd	0.014	bd	bd	0.012	bd	0.020	bd	bd				
c-4-Methyl-2-Pentene	0.008	0.002	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
Camphene	bd	0.010	0.008	0.030	0.004	0.012	0.008	0.018	0.042	0.028	0.082	0.018				
Carbontetrachloride	0.588	0.636	0.634	0.640	0.628	0.664	0.684	0.710	0.670	0.632	0.664	0.702		7.2	60000	128400
Chlorobenzene	bd	bd	0.010	0.012	0.016	0.018	0.020	0.020	0.020	0.008	0.020	0.016		4200	980	280000
Chloroethane	0.120	0.024	0.110	0.076	0.078	0.096	0.108	0.126	0.132	0.020	0.144	0.140				
Chloroform	0.104	0.068	0.076	0.068	0.080	0.062	0.080	0.082	0.056	0.108	0.056	0.086		300	250000	1000000
Chloromethane	1.192	1.172	1.240	1.178	1.142	1.166	1.122	1.082	1.178	1.140	1.154	1.100		20000		
Cyclohexane	0.104	0.056	0.114	0.074	0.058	0.026	0.038	0.096	0.088	0.040	0.060	0.084		300000	1435	
Cyclohexene	0.016	bd	0.004	bd	bd	bd	bd	0.002	bd	0.012	0.006	bd				
Cyclopentane	0.102	0.048	0.086	0.050	0.038	0.022	0.036	0.124	0.064	0.032	0.050	0.090				
Cyclopentene	0.024	0.006	0.006	0.004	0.008	0.002	0.002	0.008	0.002	0.004	0.002	0.006				
Decane	0.086	0.016	0.032	0.020	0.030	0.012	0.014	0.054	0.016	0.108	0.018	0.028				
Dibromochloromethane	0.004	0.008	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
Dibromomethane	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
Dichloromethane	0.210	0.230	0.190	0.182	0.180	0.256	0.174	0.278	0.238	0.312	0.196	0.172		5300	540000	2160000
Dodecane	0.202	0.026	0.062	0.080	0.096	0.042	0.038	0.048	0.048	0.216	0.044	0.044				
Ethane	7.959	4.235	5.935	3.292	4.179	2.474	8.470	11.869	4.310	2.272	3.738	3.902			184500	1105770
Ethanol	22.358	2.609	7.950	14.348	32.240	23.040	30.680	21.980	34.931	bd	38.748	31.008		19000	342	9690000
Ethylbenzene	0.196	0.050	0.070	0.044	0.042	0.030	0.054	0.380	0.032	0.048	0.068	0.148		3000	8700	870000
Ethylbromide	0.008	0.004	0.008	0.008	0.008	0.006	0.006	0.006	0.006	bd	0.008	0.006			890000	
Ethylene	0.597	0.470	1.246	0.318	0.396	0.300	0.940	2.492	0.562	0.388	2.552	1.479			299000	4600000
Ethylene Oxide	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd		15	520000	1400000

[a] Alberta Ambient Air Quality Guidelines, Alberta Environment, February 2000. [b] Summary of Point of Impingement Standards, Point of Impingement Guidelines, and Ambient Air Quality Criteria, Ontario Ministry of the Environment, September 2001.

[c] Odour thresholds from the 1996 paper entitled "Odor Thresholds and Irritation Levels of Several Chemical substances: A review" published by the American Industrial Hygiene Association and the "3M 2001 Respirator Selection Guide" available at www.3m.com.

Table II: continued

Fort Saskatchewan Incident Canister Sampling (March 27 to May 26, 2002) Concentration (µg/m³)																
Location	A												Alberta One-hour Guideline[a] (µg/m³)	Ontario Half-hour Point of Impingement Limit[b] (µg/m³)	Odour Threshold Range[c] (µg/m³)	
Sampling Date	3/27/02	4/2/02	4/8/02	4/14/02	4/21/02	4/27/02	5/2/02	5/8/02	5/14/02	5/17/02	5/20/02	5/26/02				
Sample Type	24-hour															
Compound Name	Concentration (µg/m³)														Low	High
Freon 11	1.732	1.732	1.714	1.742	1.760	1.804	1.780	1.794	1.800	1.852	1.766	1.856		18000	28000	1170400
Freon 113	0.616	0.620	0.620	0.628	0.630	0.634	0.634	0.636	0.638	0.664	0.629	0.662		2400000	342000	1026000
Freon 114	0.112	0.112	0.110	0.112	0.112	0.112	0.112	0.114	0.112	0.140	0.112	0.116		2100000		
Freon 12	2.624	2.608	2.568	2.620	2.574	2.616	2.642	2.662	2.648	2.724	2.584	2.684		1500000		
Freon 22	0.520	0.508	0.574	0.512	0.508	0.586	0.494	0.624	0.554	0.488	0.484	0.592		1050000		
Heptane	0.230	0.096	0.184	0.092	0.112	0.044	0.046	0.138	0.078	0.128	0.076	0.082		33000	200000	1280000
Hexachlorobutadiene	bd	bd	bd	bd	0.002	bd	bd	bd	0.002	bd	bd	bd			12000	
Hexane	0.356	0.168	0.358	0.184	0.182	0.088	0.128	0.400	0.216	0.148	0.212	0.278		35000	77141	
Hexylbenzene	0.022	0.004	0.010	0.010	0.010	0.008	0.006	0.004	0.008	0.012	0.012	0.008				
Ibdan	0.078	0.018	0.026	0.006	0.012	0.002	0.004	0.012	0.006	0.020	0.008	0.006				
Isobutane	1.408	0.692	1.356	0.514	0.780	0.280	0.718	1.506	0.706	0.356	0.492	0.744				
iso-Butylbenzene	0.004	bd	bd	0.002	bd	bd	bd	0.002	bd	bd	0.002	0.002				
Isoprene	0.030	0.030	0.028	0.048	0.024	0.036	0.008	0.036	0.088	0.068	0.282	0.100				
iso-Propylbenzene	0.042	0.010	0.006	0.008	0.004	0.002	0.002	0.008	0.002	0.016	0.006	0.006		100		
Limonene	0.022	0.006	bd	0.010	bd	0.006	0.006	0.016	0.018	0.048	0.012	0.004				
m,p-Xylene	0.634	0.122	0.148	0.112	0.082	0.088	0.088	0.444	0.080	0.060	0.132	0.196		2300	348	174000
Methyl Alcohol	4.038	1.740	3.760	2.582	7.040	7.940	3.000	2.300	8.243	bd	10.670	8.059		12000		
Methylcyclohexane	0.108	0.062	0.118	0.086	0.054	0.028	0.036	0.118	0.094	0.068	0.088	0.068			2000000	
Methylcyclopentane	0.194	0.092	0.190	0.100	0.066	0.040	0.062	0.274	0.134	0.044	0.092	0.176				
Methyl-t-Butyl Ether (MTBE)	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd		2200		
Naphthalene	0.208	0.032	0.062	0.070	0.050	0.048	0.034	0.058	0.080	0.048	0.080	0.050		36	1500	125000
n-Butylbenzene	0.008	0.004	0.008	0.006	0.004	bd	0.004	0.008	0.006	0.004	0.010	0.006				
Nonane	0.082	0.026	0.054	0.032	0.048	0.022	0.024	0.064	0.028	0.144	0.032	0.036			3412500	3412500
n-Propylbenzene	0.034	0.008	0.014	0.008	0.010	0.008	0.006	0.024	0.008	0.012	0.014	0.014				
Octane	0.152	0.066	0.076	0.068	0.072	0.032	0.032	0.092	0.050	0.112	0.054	0.048		45400	725000	1208330
o-Xylene	0.236	0.044	0.056	0.046	0.032	0.038	0.038	0.168	0.034	0.024	0.056	0.080			3893	
p-Cymene	0.016	0.004	0.004	0.006	bd	0.004	0.004	0.006	0.018	bd	0.020	0.010				
Pentane	0.884	0.458	1.060	0.588	0.500	0.232	0.422	1.304	0.928	0.432	0.690	0.930			6800	3000000
Propane	3.822	2.560	4.640	1.668	2.214	0.874	1.692	3.870	1.958	1.036	1.600	1.774			1800000	36000000
Propene	0.282	0.240	0.342	0.098	0.140	0.072	0.112	0.428	0.174	0.152	0.788	0.374				
Propyne	0.018	0.016	0.016	0.012	bd	0.004	bd	0.018	0.018	bd	0.090	0.016				
sec-Butylbenzene	0.004	bd	bd	0.002	bd	bd	bd	bd	bd	bd	bd	bd				
Styrene	0.036	0.008	0.074	0.022	0.032	0.012	0.014	0.108	0.016	0.016	0.040	0.108	215	400	202	860000
t-1,2-Dichloroethene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
t-1,2-Dimethylcyclohexane	bd	bd	bd	0.014	bd	bd	bd	bd	bd	bd	bd	bd				
t-1,3-Dichloropropene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
t-1,4-Dimethylcyclohexane	0.010	0.004	0.012	0.008	0.006	bd	0.004	0.014	0.010	0.012	0.008	0.008				
t-2-Butene	0.020	0.016	0.014	0.006	0.010	bd	0.006	0.028	0.006	0.024	0.006	0.014				
t-2-Heptene	bd	bd	bd	0.004	bd	bd	bd	0.008	bd	bd	bd	bd				
t-2-Hexene	0.020	0.008	0.006	bd	0.004	bd	bd	0.012	bd	0.012	bd	0.008				
t-2-Octene	bd	bd	bd	0.010	bd	bd	bd	bd	bd	bd	bd	bd				
t-2-Pentene	0.058	0.020	0.018	0.010	0.012	0.008	0.010	0.044	0.008	0.032	0.008	0.032				
t-3-Heptene	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
t-3-Methyl-2-Pentene	0.020	0.008	bd	bd	bd	bd	bd	bd	bd	bd	bd	bd				
t-4-Methyl-2-Pentene	0.028	0.012	bd	bd	0.014	bd	bd	bd	bd	bd	bd	bd				
tert-Butylbenzene	bd	bd	bd	0.064	bd	0.064	0.048	0.058	bd	0.048	0.128	0.102				
Tetrachloroethene	0.078	0.044	0.048	0.040	0.044	0.038	0.034	0.098	0.036	0.036	0.032	0.042		10000		
Toluene	0.796	0.254	0.224	0.156	0.138	0.100	0.178	0.780	0.180	0.164	0.472	0.408		2000	8025	150000
Trichloroethene	0.036	0.020	0.020	0.026	0.024	0.022	0.020	0.030	0.020	0.016	0.024	0.024		3500		
Undecane	0.140	0.022	0.054	0.048	0.050	0.020	0.020	0.054	0.034	0.164	0.030	0.036				
Vinylchloride	0.020	bd	0.092	bd	0.084	0.002	0.144	0.264	bd	0.004	0.002	0.218	130	3	646	

[a] Alberta Ambient Air Quality Guidelines, Alberta Environment, February 2000. [b] Summary of Point of Impingement Standards, Point of Impingement Guidelines, and Ambient Air Quality Criteria, Ontario Ministry of the Environment, September 2001.

[c] Odour thresholds from the 1996 paper entitled "Odor Thresholds and Irritation Levels of Several Chemical substances: A review" published by the American Industrial Hygiene Association and the "3M 2001 Respirator Selection Guide" available at www.3m.com

bd Below Detection Limit

Table III: Fort Saskatchewan Incident Canister Sampling (June 1 to July 31, 2002) Concentration (µg/m^3)

Fort Saskatchewan Incident Canister Sampling (June 1 to July 31, 2002) Concentration (µg/m^3)														
Location	A											Alberta One-hour Guideline[a] (µg/m^3)	Ontario Half-hour Point of Impingement Limit[b] (µg/m^3)	Odour Threshold Range[c] (µg/m^3)	
Sampling Date	6/1/02	6/6/02	6/13/02	6/19/02	6/25/02	7/1/02	7/7/02	7/13/02	7/19/02	7/25/02	7/31-Jul-02				
Sample Type	24-hour										48-hour				
Compound Name	Concentration (µg/m^3)													Low	High
1,1,1-Trichloroethane	0.214	0.210	0.214	0.199	0.186	0.192	0.189	0.181	0.182	0.180	0.176		350000	122139	
1,1,2,2-Tetrachloroethane	bd		0.002	bd										21000	35000
1,1,2-Trichloroethane	bd														
1,1-Dichloroethane	bd						0.003	bd					600	891536	
1,1-Dichloroethene	0.008	bd								0.025	0.019		30		
1,2,3-Trimethylbenzene	0.018	0.016	0.149	0.032	0.023	0.017	0.013	0.014	0.020	0.037	0.021				
1,2,4-Trichlorobenzene	0.004	0.005	0.006	0.004	0.004	bd	0.003	0.005	0.003	0.005	0.005		100	24000	24000
1,2,4-Trimethylbenzene	0.054	0.047	0.339	0.116	0.082	0.043	0.035	0.029	0.061	0.146	0.048		500		
1,2-Dibromoethane (EDB)	bd	0.002	0.002	bd									9	76800	76800
1,2-Dichlorobenzene	0.002	0.003	0.003	0.002	0.003	0.002	0.002	0.002	0.002	0.003	0.003		37000	12000	300000
1,2-Dichloroethane	0.048	0.033	0.239	0.971	0.089	0.026	0.027	0.019	0.067	0.176	0.019		6	24000	440000
1,2-Dichloropropane	bd	0.011	0.007	bd		0.007	0.008	bd					2400	1167	606666
1,2-Diethylbenzene	bd	0.002	0.006	0.003	0.002	0.002	0.002	0.002	0.003	0.004	bd				
1,3,5-Trimethylbenzene	0.012	0.012	0.157	0.025	0.020	0.011	0.009	0.007	0.015	0.035	0.013				
1,3-Butadiene	0.016	0.007	0.011	0.016	0.006	0.006	0.003	0.023	0.008	0.038	0.009			352	2860
1,3-Dichlorobenzene	0.002	0.003	0.004	0.002	0.002	0.002	0.002	0.003	0.002	0.003	0.003				
1,3-Diethylbenzene	0.004	0.003	0.022	0.009	0.004	0.003	0.003	bd	0.004	0.010	0.005				
1,4-Dichlorobenzene	0.008	0.007	0.021	0.014	0.011	0.007	0.008	0.009	0.009	0.019	0.007		285	288	
1,4-Dichlorobutane	bd														
1,4-Diethylbenzene	bd	0.016	0.065	0.031	0.020	0.018	0.010	bd	0.016	0.028	0.021				
1-Butene/2-Methylpropene	0.144	0.091	0.102	0.096	0.094	0.070	0.085	0.558	0.088	0.404	0.348				
1-Butyne	bd		0.003	bd											
1-Decene	bd	0.008	0.018	0.004	0.009	0.012	0.006	0.013	bd				180000		
1-Heptene	bd						0.070	bd							
1-Hexene/2-Methyl-1-Pentene	0.030	0.037	0.048	0.048	0.041	0.020	0.024	bd							
1-Methylcyclohexene	bd	0.003	0.003	bd		0.002	bd								
1-Methylcyclopentene	0.010	0.009	0.003	0.004	0.012	0.009	0.003	bd	0.010	0.024	0.011				
1-Nonene	0.034	bd													
1-Octene	bd	0.014	0.049	0.050	0.023	0.021	0.022	bd		0.037	bd		150000		
1-Pentene	0.070	0.044	0.060	0.060	0.070	0.051	0.037	0.040	0.061	0.139	0.043				
1-Undecene	bd							2.885	1.844	1.438	bd				
2,2,3-Trimethylbutane	bd		0.003	0.004	bd		0.002	bd							
2,2,4-Trimethylpentane	0.066	0.089	0.222	0.256	0.109	0.062	0.033	0.011	0.094	0.354	0.028				
2,2,5-Trimethylhexane	bd	0.007	bd	0.009			bd			0.012	bd				
2,2-Dimethylbutane	0.022	0.061	0.072	0.061	0.043	0.024	0.019	0.008	0.041	0.106	0.013				
2,2-Dimethylhexane	bd	0.003	bd												
2,2-Dimethylpentane	0.008	0.007	0.015	0.016	0.008	0.004	0.007	bd	0.007	0.016	bd				
2,2-Dimethylpropane	0.008	0.007	0.017	0.020	0.015	0.009	0.012	0.009	0.011	0.026	0.008				
2,3,4-Trimethylpentane	0.024	0.038	0.060	0.071	0.034	0.025	0.019	bd	0.039	0.098	bd				
2,3-Dimethylbutane	0.066	0.058	0.166	0.162	0.093	0.048	0.056	0.019	0.077	0.269	0.032				
2,3-Dimethylpentane	0.074	0.097	0.186	0.193	0.114	0.072	0.057	bd	0.103	0.294	0.039				
2,4-Dimethylhexane	0.010	0.015	0.028	0.030	0.014	0.009	0.010	0.004	0.014	0.039	bd				
2,4-Dimethylpentane	0.046	0.044	0.101	0.110	0.057	0.036	0.034	bd	0.056	0.167	0.032				
2,5-Dimethylhexane	0.012	0.014	0.022	0.021	0.016	0.009	0.014	0.008	0.013	0.036	bd				
2-Ethyl-1-Butene	0.024	bd													
2-Ethyltoluene	0.012	0.012	0.120	0.039	0.017	0.010	0.009	0.008	0.014	0.033	0.012				
2-Methyl-1-Butene	0.058	0.057	0.047	0.054	0.094	0.057	0.039	0.019	0.072	0.211	0.048				
2-Methyl-2-Butene	0.046	0.062	0.037	0.032	0.093	0.061	0.024	bd	0.094	0.185	0.036				
2-Methylbutane	1.504	0.920	3.613	5.739	2.237	1.062	1.533	0.353	1.858	5.783	0.814				
2-Methylheptane	0.020	0.032	0.092	0.050	0.032	0.016	0.034	bd	0.027	0.082	bd				
2-Methylhexane	0.072	0.066	0.134	0.153	0.097	0.048	0.089	bd	0.083	0.256	bd				
2-Methylpentane	0.216	0.165	0.520	0.612	0.314	0.125	0.246	0.045	0.225	1.020	0.089				
3,6-Dimethyloctane	bd	0.088	0.046	bd		0.004	bd								

[a] Alberta Ambient Air Quality Guidelines, Alberta Environment, February 2000

[b] Summary of Point of Impingement Standards, Point of Impingement Guidelines, and Ambient Air Quality Criteria, Ontario Ministry of the Environment, September 2001

[c] Odour thresholds from the 1968 paper entitled "Odor Thresholds and Irritation Levels of Several Chemical Substances: A review" published by the American Industrial Hygiene Association and the "3M 2001 Respirator Selection Guide" available at www.3m.com

bd Below Detection Limit

Table III: continued

Fort Saskatchewan Incident Canister Sampling (June 1 to July 31, 2002) Concentration (µg/m³)															
Location	A														
Sampling Date	6/1/02	6/5/02	6/13/02	6/19/02	6/23/02	7/1/02	7/7/02	7/13/02	7/19/02	7/25/02	27&31-Jul-02	Alberta One-hour Guideline* (µg/m³)	Ontario Half-hour Point of Impingement Limit* (µg/m³)	Odour Threshold Range¹ (µg/m³)	
Sample Type	24-hour										48-hour				
Compound Name	Concentration (µg/m³)													Low	High
3-Ethyltoluene	0.022	0.024	0.222	0.071	0.031	0.019	0.017	0.011	0.030	0.070	0.022				
3-Methyl-1-Butene	0.020	0.012	0.018	0.017	0.018	0.014	0.008	0.009	0.018	0.044	0.010				
3-Methyl-1-Pentene	bd		0.013		bd		0.011	bd		0.021	bd				
3-Methylheptane	0.048	0.041	0.046	0.051	0.049	0.035	0.045	bd		0.081	bd				
3-Methylhexane	0.072	0.069	0.142	0.160	0.098	0.045	0.087	bd	0.077	0.270	bd				
3-Methylpentane	0.188	0.151	0.429	0.505	0.305	0.123	0.241	0.056	0.226	0.831	0.118				
4-Ethyltoluene	0.010	0.011	0.111	0.038	0.017	0.009	0.008	0.009	0.014	0.031	0.010				
4-Methyl-1-Pentene	bd						0.006	bd							
4-Methylheptane	0.006	0.010	0.017	0.017	0.009	0.005	0.009	bd		0.023	bd				
Acetaldehyde	4.429	13.256	7.709	11.819	12.138	7.271	7.578	10.980	7.738	32.634	13.462	90		0.2	4140
Acetone	3.312	3.866	5.189	5.136	7.583	4.661	3.486	6.885	7.386	9.610	3.841		48000	47466.6	1613860
Acetylene	0.227	0.216	0.654	0.451	0.230	0.167	0.144	0.169	0.251	0.470	0.111		56000	657200	
a-Pinene	0.168	0.089	0.547	0.174	0.937	0.046	0.449	0.658	0.554	0.737	0.050				
Benzene	0.088	0.225	1.890	0.766	0.308	0.129	0.277	0.389	0.374	0.707	0.149	30		4500	270000
Benzyl Chloride	bd	0.002	0.027	bd	0.007	0.002	bd							235	1550
b-Pinene	bd			0.057	0.264	0.059	0.187	0.429	0.198	bd					
Bromodichloromethane	bd	0.007	bd		0.011	0.007	bd								
Bromoform	0.014	0.015	0.011	0.010	0.008	0.023	0.010	0.008	0.009	0.011	0.013		165	5300000	
Bromomethane	0.068	0.083	0.072	0.076	0.105	0.070	0.077	0.114	0.096	0.193	0.109		4000		
Bromotrichloromethane	bd														
Butane	2.088	0.988	3.238	4.788	2.909	1.554	2.262	0.440	2.328	7.020	1.290			2850	14630
c-1,2-Dichloroethene	bd												315		
c-1,2-Dimethylcyclohexane	bd	0.020	0.016	0.019	0.013	0.016	0.013	bd							
c-1,3-Dichloropropene	bd														
c-1,3-Dimethylcyclohexane	0.014	0.016	0.047	0.043	0.032	0.011	0.045	0.018	0.022	0.075	0.015				
c-1,4/t-1,3-Dimethylcyclohexane	bd	0.005	0.012	0.011	0.005	0.003	0.005	bd							
c-2-Butene	0.032	0.016	0.016	0.017	0.034	0.022	0.009	0.012	0.029	0.080	0.017				
c-2-Heptene	bd		0.069				bd				0.058				
c-2-Hexene	0.008	0.008	0.004	0.005	0.008	0.006	0.002	bd							
c-2-Pentene	0.024	0.036	0.022	0.022	0.034	0.023	0.011	bd	0.030	0.078	0.015				
c-3-Heptene	bd			0.024	0.030	0.015	0.036	bd							
c-3-Methyl-2-Pentene	0.012	0.014	0.006	0.005	0.015	0.009	bd		0.011	0.030	bd				
c-4-Methyl-2-Pentene	bd	0.008	0.008	bd	0.003	0.010	bd								
Camphene	0.034	0.022	0.099	0.022	0.076	0.022	0.073	0.186	0.051	0.075	0.022				
Carbontetrachloride	0.694	0.687	0.696	0.664	0.642	0.650	0.641	0.631	0.634	0.619	0.613		7.2	60000	128400
Chlorobenzene	0.020	0.019	0.034	0.014	0.027	0.021	0.027	0.027	0.016	0.024	0.018		4200	980	280000
Chloroethane	0.120	0.113	0.241	0.128	0.293	0.144	0.278	0.339	0.103	0.365	0.123				
Chloroform	0.072	0.065	0.088	0.090	0.062	0.058	0.081	0.050	0.055	0.078	0.060		300	250000	1000000
Chloromethane	1.130	1.090	1.137	1.059	1.169	1.132	1.110	1.090	1.072	1.068	1.014		20000		
Cyclohexane	0.052	0.041	0.088	0.092	0.070	0.030	0.104	0.024	0.050	0.159	0.034		300000	1435	
Cyclohexene	0.008	0.003	bd		0.004			bd			0.007				
Cyclopentane	0.082	0.041	0.180	0.164	0.084	0.036	0.073	0.021	0.073	0.274	0.033				
Cyclopentene	0.008	0.007	0.004	0.005	0.011	0.009	0.004	0.003	0.010	0.024	0.008				
Decane	0.029	0.018	1.576	0.074	0.048	0.022	0.029	0.023	0.032	0.087	0.035				
Dibromochloromethane	bd	0.004		bd		0.008	bd								
Dibromomethane	bd	0.033	0.033	0.030	0.034	0.031	0.032	bd							
Dichloromethane	0.164	0.151	0.225	0.256	0.158	0.145	0.152	0.134	0.159	0.168	0.135		5300	540000	2160000
Dodecane	0.056	0.050	0.262	0.053	0.051	0.035	0.039	0.045	0.034	0.062	0.029				
Ethane	3.787	2.285	1.101	3.995	3.525	3.623	4.556	2.199	1.780	2.496	2.470			184500	1105770
Ethanol	33.333	50.764	68.116	63.942	111.588	86.588	54.641	85.986	58.691	494.600	147.522		19000	342	9680000
Ethylbenzene	0.100	0.064	1.143	0.403	0.150	0.040	0.133	0.040	0.104	0.365	0.033		3000	8700	870000
Ethylbromide	0.006	0.007	0.012	0.010	0.021	0.008	0.013	0.021	0.011	0.034	0.012			[illegible]	
Ethylene	1.144	0.377	1.109	4.033	0.715	0.346	0.425	0.999	1.488	1.554	0.381			299000	4600000
Ethylene Oxide	bd					0.009	bd						15	520000	1400000

*Alberta Ambient Air Quality Guidelines. Alberta Environment. February 2000

¹Summary of Point of Impingement Standards. Point of Impingement Guidelines and Ambient Air Quality Criteria. Ontario Ministry of the Environment. September 2001

²Odour thresholds from the 1996 paper entitled "Odor Thresholds and Irritation Levels of Several Chemical substances: A review" published by the American Industrial Hygiene Association and the "3M 2001 Respirator Selection Guide" Available at www.3m.com

Table III: continued

Fort Saskatchewan Incident Canister Sampling (June 1 to July 31, 2002) Concentration (µg/m³)															
Location	A											Alberta One-hour Guideline[1] (µg/m³)	Ontario Half-hour Point of Impingement Limit[2] (µg/m³)	Odour Threshold Range[3] (µg/m³)	
Sampling Date	06/01/02	06/06/02	06/13/02	06/19/02	06/25/02	07/01/02	07/07/02	07/13/02	07/19/02	07/25/02	27&31-Jul-02				
Sample Type	24-hour										48-hour				
Compound Name	Concentration (µg/m³)													Low	High
Freon 11	1.852	1.791	1.801	1.786	1.766	1.794	1.741	1.714	1.772	1.716	1.718		18000	28000	1170400
Freon 113	0.660	0.658	0.655	0.640	0.634	0.650	0.641	0.616	0.639	0.570	0.574		2400000	342000	1026000
Freon 114	0.116	0.111	0.112	0.115	0.113	0.116	0.114	0.109	0.111	0.106	0.107		2100000		
Freon 12	2.670	2.613	2.644	2.697	2.904	2.890	2.733	2.590	2.768	2.562	2.597		1500000		
Freon 22	0.570	0.502	0.584	0.596	0.526	0.534	0.541	0.473	0.518	0.523	0.492		1050000		
Heptane	0.074	0.065	0.138	0.151	0.095	0.042	0.117	0.039	0.079	0.230	0.041		33000	200000	1280000
Hexachlorobutadiene	bd	0.001					bd							12000	
Hexane	0.204	0.082	0.412	0.458	0.244	0.079	0.290	0.063	0.175	0.694	0.081		35000	77141	
Hexylbenzene	0.006	0.007	0.011	0.005	0.007	0.006	0.005	0.007	0.005	0.007	0.003				
Indan	0.008	0.008	0.038	0.018	0.009	0.005	0.004	bd	0.010	0.015	0.008				
Isobutane	0.570	0.275	1.154	1.853	0.969	0.393	0.894	0.241	0.692	1.762	0.424				
iso-Butylbenzene	bd	0.001	0.009	0.004	0.002			bd		0.003	0.002				
Isoprene	0.318	0.237	3.787	0.403	6.606	1.183	3.236	22.181	2.517	12.421	1.242				
iso-Propylbenzene	0.006	0.005	0.027	0.012	0.005	0.003	0.003	bd	0.005	0.011	0.003		100		
Limonene	0.014	0.005	0.065	0.010	0.082	0.008	0.034	0.064	0.072	0.085	0.009				
m,p-Xylene	0.156	0.164	0.408	0.327	0.190	0.116	0.098	0.072	0.216	0.547	0.089		2300	348	174000
Methyl Alcohol	9.823	9.195	25.215	11.506	21.297	13.399	7.280	19.783	18.679	25.582	15.044		12000		
Methylcyclohexane	0.050	0.037	0.119	0.101	0.075	0.027	0.130	0.027	0.053	0.166	0.030			2000000	
Methylcyclopentane	0.158	0.087	0.225	0.257	0.164	0.062	0.178	0.032	0.116	0.458	0.052				
Methyl-t-Butyl Ether (MTBE)					bd					0.203	bd		2200		
Naphthalene	0.058	0.042	0.131	0.058	0.083	0.042	0.046	0.064	0.046	0.087	0.028		36	1500	125000
n-Butylbenzene	0.006	0.005	0.021	0.011	0.008	0.005	0.005	bd	0.006	0.010	0.005				
Nonane	0.036	0.032	0.262	0.065	0.037	0.017	0.035	0.025	0.033	0.076	0.026			3412500	3412500
n-Propylbenzene	0.012	0.012	0.093	0.039	0.018	0.009	0.009	0.009	0.015	0.034	0.010				
Octane	0.054	0.055	0.104	0.089	0.054	0.032	0.065	0.044	0.060	0.115	0.036		45400	725000	1208330
o-Xylene	0.064	0.065	0.168	0.134	0.076	0.046	0.038	0.031	0.087	0.203	0.035			3803	
p-Cymene	bd	0.008	0.036	0.015	0.015	0.007	0.011	0.022	0.017	0.026	0.010				
Pentane	0.580	0.343	1.963	2.535	1.117	0.436	1.101	0.271	0.945	2.788	0.426			6600	3000000
Propane	1.302	0.775	2.738	2.613	1.636	1.026	2.609	0.756	1.838	4.116	1.565			1800000	36000000
Propene	0.454	0.111	0.316	0.206	0.142	0.086	0.173	0.339	0.227	0.468	0.207				
Propyne	0.008	0.003	0.034	0.023	0.012	0.007	0.009	0.033	0.017	0.048	0.013				
sec-Butylbenzene	bd	0.001	0.010	0.005	0.003			bd		0.004	bd				
Styrene	0.102	0.011	1.455	0.167	0.244	0.010	0.036	0.024	0.083	0.472	0.013	215	400	202	860000
t-1,2-Dichloroethene	bd		0.001					bd							
t-1,2-Dimethylcyclohexane	bd	0.006	0.024	0.020	0.012	0.004	0.021			bd					
t-1,3-Dichloropropene						bd									
t-1,4-Dimethylcyclohexane	0.006	0.005	0.014	0.013	0.009	0.003	0.013	0.004	0.009	0.020	0.004				
t-2-Butene	0.026	0.012	0.008	0.014	0.023	0.019	0.007	0.006	0.020	0.070	0.015				
t-2-Heptene	bd	0.006	0.004	0.003	0.005	0.004	0.003			bd					
t-2-Hexene	0.010	0.015	0.004	0.006	0.013	0.008	0.003	0.018	bd	0.025	0.007				
t-2-Octene	bd	0.007		bd		0.003	0.074			bd					
t-2-Pentene	0.044	0.053	0.032	0.039	0.070	0.056	0.020	bd	0.060	0.219	0.033				
t-3-Heptene	bd	0.006	0.006					bd							
t-3-Methyl-2-Pentene	bd	0.008	0.010	0.004	0.013	0.005				bd					
t-4-Methyl-2-Pentene	bd	0.002					bd								
tert-Butylbenzene	0.104	0.049	0.181			bd			0.268	bd	0.335	0.075			
Tetrachloroethene	0.030	0.027	0.072	0.079	0.036	0.020	0.021	0.037	0.037	0.055	0.019		10000		
Toluene	0.442	0.341	1.030	0.886	0.491	0.219	0.183	0.241	0.512	1.108	0.178		2000	8025	150000
Trichloroethene	0.020	0.019	0.044	0.051	0.103	0.029	0.045	0.111	0.054	0.181	0.065		3500		
Undecane	0.048	0.033	2.524	0.091	0.080	0.036	0.045	0.048	0.047	0.085	0.032				
Vinylchloride	0.108	bd	0.109	0.116	0.022	bd	0.009	bd	0.073	0.130	bd	130	3	646	

[1] Alberta Ambient Air Quality Guidelines, Alberta Environment, February 2000. [2] Summary of Point of Impingement Standards, Point of Impingement Guidelines, and Ambient Air Quality Criteria, Ontario Ministry of the Environment, September 2001.

[3] Odour thresholds from the 1968 paper entitled "Odor Thresholds and Irritation Levels of Several Chemical substances: A review" published by the American Industrial Hygiene Association and the "3M 2001 Respirator Selection Guide" available at www.3m.com.

Table IV: Fort Saskatchewan Incident Canister Sampling (August 6 to 30, 2002) Concentration (µg/m^3)

Fort Saskatchewan Incident Canister Sampling (August 6 to 30, 2002) Concentration (µg/m^3)									
Location	A								
Sampling Date	08/06/02	08/12/02	08/18/02	08/24/02	08/30/02	Alberta One-hour Guideline[a] (µg/m^3)	Ontario Half-hour Point of Impinge-ment Limit[a] (µg/m^3)	Odour Threshold Range[c] (µg/m^3)	
Sample Type	24-hour	24-hour	24-hour	24-hour	24-hour				
Compound Name	Concentration (µg/m^3)							Low	High
1,1,1-Trichloroethane	0.180	0.184	0.184	0.180	0.180		350000	122139	
1,1,2,2-Tetrachloroethane	bd			0.006	bd			21000	35000
1,1,2-Trichloroethane	bd			0.010	bd				
1,1-Dichloroethane	bd		0.002	bd			600	891536	
1,1-Dichloroethene	0.004	0.020	bd	0.022	0.030		30		
1,2,3-Trimethylbenzene	0.026	0.030	0.014	0.044	0.018				
1,2,4-Trichlorobenzene	0.006	0.006	0.022	0.012	0.020		100	24000	24000
1,2,4-Trimethylbenzene	0.082	0.088	0.030	0.148	0.032		500		
1,2-Dibromoethane (EDB)	bd						9	76800	76800
1,2-Dichlorobenzene	0.002	bd	0.006	0.004	0.008		37000	12000	300000
1,2-Dichloroethane	0.068	0.146	0.036	0.480	0.016		6	24000	440000
1,2-Dichloropropane	bd		0.004	0.006	0.004		2400	1167	606666
1,2-Diethylbenzene	bd		0.002	0.004	bd				
1,3,5-Trimethylbenzene	0.024	0.024	0.006	0.040	0.008				
1,3-Butadiene	0.062	0.036	0.010	0.082	0.004			352	2860
1,3-Dichlorobenzene	0.002	bd	0.006	0.004	0.006				
1,3-Diethylbenzene	0.006	0.008	0.004	0.018	0.004				
1,4-Dichlorobenzene	0.008	0.012	0.012	0.024	0.008		285	288	
1,4-Dichlorobutane	bd								
1,4-Diethylbenzene	0.022	0.028	0.020	0.040	0.014				
1-Butene/2-Methylpropene	0.140	0.108	0.252	0.486	0.056				
1-Butyne	bd								
1-Decene	0.010	bd		0.008	0.016		180000		
1-Heptene	bd				0.020				
1-Hexene/2-Methyl-1-Pentene	0.030	0.036	0.032	0.064	0.008				
1-Methylcyclohexene	bd			0.004	bd				
1-Methylcyclopentene	0.012	0.012	bd	0.014	0.004				
1-Nonene	0.028	0.026	0.016	0.030	0.012				
1-Octene	bd		0.008	0.070	0.012		150000		
1-Pentene	0.060	0.068	0.036	0.114	0.030				
1-Undecene	bd			1.006	bd				
2,2,3-Trimethylbutane	bd		0.002	0.004	bd				
2,2,4-Trimethylpentane	0.136	0.174	0.064	0.386	0.014				
2,2,5-Trimethylhexane	0.008	0.008	0.004	0.014	bd				
2,2-Dimethylbutane	0.036	0.044	0.022	0.094	0.008				
2,2-Dimethylhexane	bd								
2,2-Dimethylpentane	0.008	0.006	0.006	0.016	bd				
2,2-Dimethylpropane	0.030	0.016	bd	0.024	bd				
2,3,4-Trimethylpentane	0.048	0.058	0.024	0.102	0.010				
2,3-Dimethylbutane	0.082	0.102	0.048	0.222	0.018				
2,3-Dimethylpentane	0.136	0.146	0.056	0.296	0.022				
2,4-Dimethylhexane	0.020	0.020	0.010	0.046	0.004				
2,4-Dimethylpentane	0.074	0.074	0.038	0.166	0.014				
2,5-Dimethylhexane	0.022	0.020	0.008	0.040	0.006				
2-Ethyl-1-Butene	bd			0.074	bd				
2-Ethyltoluene	0.022	0.022	0.010	0.042	0.006				
2-Methyl-1-Butene	0.076	0.106	0.034	0.166	0.030				
2-Methyl-2-Butene	0.060	0.110	0.014	0.112	0.020				
2-Methylbutane	1.998	2.520	1.268	5.264	0.450				
2-Methylheptane	0.044	0.030	0.024	0.084	0.010				
2-Methylhexane	0.124	0.108	0.058	0.282	0.022				
2-Methylpentane	0.284	0.296	0.168	0.910	0.058				
3,6-Dimethyloctane	bd			0.120	0.042				

[a] Alberta Ambient Air Quality Guidelines. Alberta Environment, February 2000

[b] Summary of Point of Impingement Standards, Point of Impingement Guidelines, and Ambient Air Quality Criteria. Ontario Ministry of the Environment. September 2001

[c] Odour thresholds from the 1986 paper entitled "Odor Thresholds and Irritation Levels of Several Chemical substances: A review" published by the American Industrial Hygiene Association and the "3M 2001 Respirator Selection Guide" available at www.3m.com

bd Below Detection Limit

Table IV: continued

Fort Saskatchewan Incident Canister Sampling (August 6 to 30, 2002) Concentration (µg/m³)									
Location	A								
Sampling Date	08/06/02	08/12/02	08/18/02	08/24/02	08/30/02	Alberta One-hour Guideline[a] (µg/m³)	Ontario Half-hour Point of Impingement Limit[b] (µg/m³)	Odour Threshold Range[c] (µg/m³)	
Sample Type	24-hour	24-hour	24-hour	24-hour	24-hour				
Compound Name	Concentration (µg/m³)							Low	High
3-Ethyltoluene	0.044	0.046	0.018	0.080	0.012				
3-Methyl-1-Butene	0.018	0.024	0.010	0.040	0.008				
3-Methyl-1-Pentene	bd		0.004	0.014	bd				
3-Methylheptane	0.064	0.050	0.038	0.088	0.028				
3-Methylhexane	0.116	0.098	0.068	0.272	0.020				
3-Methylpentane	0.284	0.290	0.238	0.792	0.060				
4-Ethyltoluene	0.020	0.018	0.010	0.038	0.008				
4-Methyl-1-Pentene	bd		0.004	0.028	bd				
4-Methylheptane	0.016	bd		0.026	bd				
Acetaldehyde	24.400	10.868	20.473	8.617	5.089	90		0.2	4140
Acetone	5.924	3.971	4.228	3.852	1.663		48000	47466.6	1613860
Acetylene	1.476	0.330	0.255	1.093	0.114		56000	657200	
a-Pinene	0.278	0.074	0.038	0.734	0.336				
Benzene	0.348	0.344	0.316	1.268	0.116	30		4500	270000
Benzyl Chloride	bd		0.006	0.002	0.006			235	1550
b-Pinene	bd		0.018	0.194	0.188				
Bromodichloromethane	bd		0.010	bd	0.008				
Bromoform	0.012	0.022	0.014	0.012	0.012		165	5300000	
Bromomethane	0.108	0.118	0.120	0.160	0.106		4000		
Bromotrichloromethane	bd								
Butane	11.376	3.284	2.022	6.656	0.696			2850	14630
c-1,2-Dichloroethene	bd						315		
c-1,2-Dimethylcyclohexane	bd		0.018	0.022	bd				
c-1,3-Dichloropropene	bd								
c-1,3-Dimethylcyclohexane	0.034	0.022	0.018	0.062	0.010				
c-1,4/t-1,3-Dimethylcyclohexane	0.008	bd	0.004	0.018	bd				
c-2-Butene	0.024	0.032	0.012	0.058	0.010				
c-2-Heptene	bd	0.064	0.090	0.086	0.036				
c-2-Hexene	0.008	0.008	bd	0.010	bd				
c-2-Pentene	0.024	0.070	0.008	0.056	0.010				
c-3-Heptene	bd		0.026	0.042	0.024				
c-3-Methyl-2-Pentene	0.014	0.014	bd	0.018	bd				
c-4-Methyl-2-Pentene	bd			0.018	0.004				
Camphene	0.024	0.020	0.010	0.052	0.096				
Carbontetrachloride	0.616	0.626	0.622	0.672	0.652		7.2	60000	128400
Chlorobenzene	0.016	0.016	0.020	0.024	0.018		4200	980	280000
Chloroethane	0.108	0.126	0.140	0.270	0.094				
Chloroform	0.068	0.068	0.064	0.092	0.052		300	250000	1000000
Chloromethane	0.924	1.008	0.968	1.042	1.088		20000		
Cyclohexane	0.090	0.062	0.054	0.182	0.020		300000	1435	
Cyclohexene	bd		0.010	bd					
Cyclopentane	0.074	0.086	0.058	0.210	0.020				
Cyclopentene	0.010	0.012	0.004	0.016	0.004				
Decane	0.026	0.046	0.024	0.094	0.052				
Dibromochloromethane	bd		0.004	bd	0.004				
Dibromomethane	bd		0.046	0.064	0.046				
Dichloromethane	0.126	0.166	0.134	0.206	0.118		5300	540000	2160000
Dodecane	0.040	0.042	0.030	0.052	0.020				
Ethane	5.717	6.058	3.176	8.220	0.860			184500	1105770
Ethanol	74.476	82.486	69.767	133.020	86.507		19000	342	9690000
Ethylbenzene	0.114	0.140	0.070	1.470	0.022		3000	8700	870000
Ethybromide	0.010	0.012	0.010	0.020	0.010			890000	
Ethylene	1.370	1.827	0.721	3.491	0.288			299000	4600000
Ethylene Oxide	0.248	bd					15	520000	1400000

[a] Alberta Ambient Air Quality Guidelines, Alberta Environment, February 2000

[b] Summary of Point of Impingement Standards, Point of Impingement Guidelines, and Ambient Air Quality Criteria, Ontario Minister of the Environment, September 2001

[c] Odour thresholds from the 1986 paper entitled "Odor Thresholds and Irritation Levels of Several Chemical substances: A review" published by the American Industrial Hygiene Association and the "3M 2001 Respirator Selection Guide" available at www.3m.com

bd Below Detection Limit

Table IV: continued

Fort Saskatchewan Incident Canister Sampling (August 6 to 30, 2002) Concentration (µg/m³)									
Location	A								
Sampling Date	08/06/02	08/12/02	08/18/02	08/24/02	08/30/02	Alberta One-hour Guideline* (µg/m³)	Ontario Half-hour Point of Impinge-ment Limit* (µg/m³)	Odour Threshold Range* (µg/m³)	
Sample Type	24-hour	24-hour	24-hour	24-hour	24-hour			Low	High
Compound Name	Concentration (µg/m³)								
Freon 11	1.738	1.730	1.724	1.746	1.770		18000	28000	1170400
Freon 113	0.622	0.626	0.622	0.624	0.646		2400000	342000	1026000
Freon 114	0.114	0.112	0.112	0.110	0.112		2100000		
Freon 12	2.656	2.668	2.612	2.644	2.704		1500000		
Freon 22	0.578	0.542	0.752	0.588	0.518		1050000		
Heptane	0.108	0.086	0.068	0.246	0.028		33000	200000	1280000
Hexachlorobutadiene			bd					12000	
Hexane	0.234	0.204	0.190	0.720	0.060		35000	77141	
Hexylbenzene	bd		0.006	0.006	0.006				
Indan	0.010	0.010	0.006	0.018	0.006				
Isobutane	6.294	0.984	0.704	2.052	0.154				
Iso-Butylbenzene	0.002	0.002	0.002	0.004	0.002				
Isoprene	0.464	1.942	0.390	8.908	3.916				
Iso-Propylbenzene	0.006	0.006	0.004	0.020	0.002		100		
Limonene	0.036	0.020	0.004	0.068	0.040				
m,p-Xylene	0.276	0.288	0.120	0.602	0.056		2300	348	174000
Methyl Alcohol	8.781	7.048	7.377	11.432	5.365		12000		
Methylcyclohexane	0.102	0.064	0.048	0.200	0.022			2000000	
Methylcyclopentane	0.180	0.144	0.088	0.508	0.034				
Methyl-t-Butyl Ether (MTBE)	0.038	0.004	0.018	bd			2200		
Naphthalene	0.050	0.058	0.030	0.082	0.034		36	1500	125000
n-Butylbenzene	0.006	0.008	0.006	0.012	0.004				
Nonane	0.038	0.038	0.028	0.092	0.022			3412500	3412500
n-Propylbenzene	0.020	0.020	0.012	0.048	0.006				
Octane	0.068	0.058	0.042	0.116	0.026		45400	725000	1208330
o-Xylene	0.112	0.114	0.048	0.222	0.020			3693	
p-Cymene	0.008	0.010	0.008	0.018	0.014				
Pentane	1.094	1.104	0.800	2.404	0.284			6600	3000000
Propane	5.040	3.034	2.936	6.062	0.632			1800000	36000000
Propene	0.442	0.244	0.244	0.856	0.102				
Propyne	0.040	0.024	0.016	0.064	0.008				
sec-Butylbenzene	0.002	0.002	0.002	0.006	0.002				
Styrene	0.068	0.078	0.024	0.272	0.016	215	400	202	860000
t-1,2-Dichloroethene			bd						
t-1,2-Dimethylcyclohexane	0.016	0.010	0.008	0.032	bd				
t-1,3-Dichloropropene			bd						
t-1,4-Dimethylcyclohexane	0.014	0.008	0.006	0.022	0.002				
t-2-Butene	0.024	0.030	0.010	0.054	0.006				
t-2-Heptene		bd		0.006	bd				
t-2-Hexene	0.010	0.010	bd	0.020	bd				
t-2-Octene	bd	0.006	0.072	0.008	bd				
t-2-Pentene	0.048	0.104	0.014	0.112	0.026				
t-3-Heptene			bd						
t-3-Methyl-2-Pentene	0.006	0.008	bd	0.016	bd				
t-4-Methyl-2-Pentene			bd						
tert-Butylbenzene	0.080	0.110	0.050	0.258	0.248				
Tetrachloroethene	0.026	0.034	0.026	0.090	0.016		10000		
Toluene	0.512	0.468	0.276	1.330	0.114		2000	8025	150000
Trichloroethene	0.058	0.070	0.072	0.172	0.044		3500		
Undecane	0.032	0.050	0.028	0.086	0.032				
Vinylchloride	0.006	0.024	0.020	0.266	bd	130	3	646	

*Alberta Ambient Air Quality Guidelines. Alberta Environment. February 2000

*Summary of Point of Impingement Standards, Point of Impingement Guidelines, and Ambient Air Quality Criteria.

*Odour thresholds from the 1986 paper entitled "Odor Thresholds and Irritation Levels of Several Chemical substances: A review" published by the American Industrial Hygiene Association and the "3M 2001 Respirator Selection Guide" available at www.3m.com

bd Below Detection Limit

Table V: Comparison of Fort Saskatchewan area survey VOC data to Year 2001 VOC data from Edmonton and Calgary.

Comparison of Fort Saskatchewan area survey VOC data to Year 2001 VOC data from Edmonton and Calgary																		
Location	Calgary Central			Edmonton Central			Edmonton East			Ft Sask area			Ft Sask area			Ft Sask area		
Time	2001 VOC			2001 VOC			VOC 2001			March 27 to May 26, 2002			June 1 to July 31, 2002			Aug 6 to 30, 2002		
Sample Type	24-h avg			24-h avg			24-h avg			24-h avg			24-h avg			24-h avg		
Compound (µg/m³)	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
1,1,1-Trichloroethane	0.210	0.330	0.264	0.270	*0.490*	0.324	0.220	0.360	0.268	0.206	0.336	0.221	0.180	0.214	0.195	0.180	0.184	0.182
1,1,2,2-Tetrachloroethane	bd	*0.080*	0.055	bd	*0.080*	0.049	bd	0.070	0.047	bd			bd	0.002	0.000	bd	0.006	0.001
1,1,2-Trichloroethane	bd	*0.070*	0.043	bd	0.060	0.041	bd	0.060	0.039	bd			bd			bd	0.010	0.002
1,1-Dichloroethane	bd	0.050	0.035	bd	0.050	0.030	bd	*0.160*	0.038	bd			bd	0.003	0.000	bd	0.002	0.000
1,1-Dichloroethene	bd	0.100	0.062	0.020	*0.160*	0.061	0.010	0.100	0.058	bd	0.006	0.001	bd	0.025	0.003	bd	0.030	0.015
1,2,3-Trimethylbenzene	0.060	*1.220*	0.283	0.110	0.590	0.274	0.050	0.750	0.222	0.008	0.078	0.021	0.013	0.149	0.034	0.014	0.044	0.026
1,2,4-Trichlorobenzene	bd	0.160	0.068	bd	*0.260*	0.068	bd	0.160	0.065	0.004	0.028	0.014	bd	0.006	0.004	0.006	0.022	0.013
1,2,4-Trimethylbenzene	0.230	*4.640*	1.074	0.380	2.370	1.045	0.140	2.640	0.697	0.028	0.272	0.066	0.029	0.339	0.095	0.030	0.148	0.076
1,2-Dibromoethane (EDB)	bd	*0.090*	0.057	bd	0.080	0.053	0.010	0.080	0.051	bd	0.006	0.001	bd	0.002	0.000		bd	
1,2-Dichlorobenzene	bd	*0.100*	0.050	bd	*0.100*	0.048	bd	0.080	0.044	0.002	0.020	0.007	0.002	0.003	0.002	bd	0.008	0.004
1,2-Dichloroethane	0.050	0.110	0.077	0.060	0.300	0.099	0.050	0.780	0.123	0.034	0.452	0.090	0.019	*0.971*	0.170	0.016	0.480	0.149
1,2-Dichloropropane	bd	*0.060*	0.037	bd	*0.060*	0.034	bd	*0.060*	0.032	bd			bd	0.011	0.003	bd	0.006	0.003
1,2-Diethylbenzene	bd	*0.090*	0.037	0.020	0.070	0.039	0.010	0.070	0.038	bd	0.004	0.001	bd	0.008	0.003	bd	0.004	0.001
1,3,5-Trimethylbenzene	0.040	*1.400*	0.345	0.120	0.730	0.327	0.050	0.840	0.230	0.006	0.058	0.016	0.007	0.157	0.030	0.006	0.040	0.020
1,3-Butadiene	0.110	*1.180*	0.298	0.110	0.860	0.322	0.040	0.910	0.177	0.004	0.096	0.020	0.003	0.038	0.014	0.004	0.082	0.039
1,3-Dichlorobenzene	bd	*0.090*	0.046	bd	0.080	0.045	bd	0.070	0.042	0.002	0.012	0.006	0.002	0.004	0.002	bd	0.006	0.004
1,3-Diethylbenzene	0.020	*0.300*	0.074	0.030	0.150	0.072	0.020	0.150	0.060	bd	0.008	0.003	bd	0.022	0.006	0.004	0.018	0.008
1,4-Dichlorobenzene	0.090	0.300	0.137	0.060	*0.340*	0.125	0.030	0.110	0.060	0.008	0.024	0.013	0.007	0.021	0.011	0.008	0.024	0.013
1,4-Dichlorobutane	bd	*0.040*	0.004	bd	*0.040*	0.006	bd	0.020	0.002	bd			bd			bd		
1,4-Diethylbenzene	0.050	*0.830*	0.194	0.080	0.370	0.186	0.040	0.470	0.160	bd	0.016	0.003	bd	0.065	0.020	0.014	0.040	0.025
1-Butene/2-Methylpropene	0.350	*2.440*	0.754	0.350	1.920	0.792	0.270	2.210	0.747	0.066	0.884	0.409	0.070	0.558	0.173	0.058	0.486	0.208
1-Butyne	bd	*0.080*	0.021	bd	0.060	0.025	bd	0.040	0.015	bd	0.010	0.001	bd	0.003	0.000		bd	
1-Decene	bd	0.140	0.036	bd	0.350	0.106	bd	*0.390*	0.067	bd	0.026	0.007	bd	0.018	0.007	bd	0.016	0.007
1-Heptene	0.060	0.470	0.158	0.070	0.500	0.181	0.100	*1.250*	0.392	bd	0.062	0.015	bd	0.070	0.007	bd	0.020	0.004
1-Hexene/2-Methyl-1-Pentene	0.080	0.520	0.207	0.080	0.520	0.212	0.070	*3.290*	0.325	bd	0.058	0.016	bd	0.048	0.025	0.008	0.064	0.034
1-Methylcyclohexene	0.010	*0.130*	0.059	0.020	0.120	0.058	0.020	*0.130*	0.055	bd	0.020	0.002	bd	0.003	0.001	bd	0.004	0.001
1-Methylcyclopentene	0.030	*0.470*	0.108	0.040	0.310	0.113	0.030	0.220	0.097	bd	0.072	0.011	bd	0.024	0.008	bd	0.014	0.008
1-Nonene	bd	0.120	0.050	bd	*0.260*	0.046	bd	0.190	0.043	bd	0.072	0.027	bd	0.034	0.003	0.012	0.030	0.022
1-Octene	0.020	0.110	0.037	bd	0.120	0.035	bd	*0.330*	0.061	bd	0.028	0.002	bd	0.050	0.022	bd	0.070	0.018
1-Pentene	0.090	*0.720*	0.214	0.090	0.520	0.208	0.090	0.660	0.268	0.024	0.070	0.044	0.037	0.139	0.063	0.030	0.114	0.062
1-Undecene	bd	0.090	0.010	bd	0.110	0.007	bd	0.270	0.017	bd	2.472	0.391	bd	*2.685*	0.617	bd	1.006	0.201
2,2,3-Trimethylbutane	bd	0.050	0.013	bd	0.060	0.017	bd	*0.110*	0.035	bd	0.004	0.000	bd	0.004	0.001	bd	0.004	0.001
2,2,4-Trimethylpentane	0.480	*4.150*	1.270	0.420	3.460	1.157	0.120	4.060	1.077	bd	0.284	0.060	0.011	0.354	0.130	0.014	0.386	0.155
2,2,5-Trimethylhexane	0.030	*0.220*	0.070	0.020	0.180	0.064	0.010	0.140	0.044	bd	0.008	0.002	bd	0.012	0.003	bd	0.014	0.007
2,2-Dimethylbutane	0.090	0.640	0.230	0.110	0.560	0.267	0.110	*3.120*	0.599	0.008	0.112	0.031	0.008	0.106	0.046	0.008	0.094	0.041
2,2-Dimethylhexane	0.010	0.080	0.034	0.020	0.080	0.038	0.010	*0.110*	0.046	bd	0.002	0.000	bd	0.003	0.000		bd	
2,2-Dimethylpentane	0.030	0.170	0.072	0.040	0.230	0.089	0.030	*0.390*	0.139	bd	0.014	0.008	bd	0.016	0.009	bd	0.016	0.007
2,2-Dimethylpropane	0.020	0.140	0.063	0.020	0.210	0.066	0.080	*3.960*	0.400	bd	0.026	0.013	0.007	0.026	0.013	bd	0.030	0.014
2,3,4-Trimethylpentane	0.140	*1.260*	0.380	0.120	1.060	0.341	0.040	1.010	0.268	bd	0.068	0.019	bd	0.098	0.041	0.010	0.102	0.048
2,3-Dimethylbutane	0.150	1.500	0.447	0.170	1.310	0.496	0.130	*4.320*	1.138	0.016	0.140	0.052	0.019	0.269	0.101	0.018	0.222	0.094
2,3-Dimethylpentane	0.320	2.880	0.894	0.330	2.740	0.875	0.130	*2.970*	0.982	0.018	0.218	0.079	bd	0.294	0.119	0.022	0.296	0.131
2,4-Dimethylhexane	0.080	*0.640*	0.194	0.060	0.530	0.196	0.040	0.620	0.205	bd	0.034	0.012	0.004	0.039	0.017	0.004	0.046	0.020
2,4-Dimethylpentane	0.160	1.480	0.433	0.150	1.270	0.442	0.090	*1.500*	0.563	bd	0.110	0.037	bd	0.187	0.069	0.014	0.166	0.073
2,5-Dimethylhexane	0.050	*0.420*	0.132	0.040	0.370	0.136	0.030	0.410	0.149	bd	0.026	0.011	0.008	0.036	0.016	0.006	0.040	0.019
2-Ethyl-1-Butene	0.010	*0.640*	0.125	0.030	0.510	0.136	bd	0.410	0.137	bd	0.032	0.007	bd	0.024	0.002	bd	0.074	0.015
2-Ethyltoluene	0.080	*1.010*	0.258	0.090	0.510	0.245	0.040	0.640	0.184	0.006	0.044	0.014	0.008	0.120	0.027	0.006	0.042	0.020
2-Methyl-1-Butene	0.110	*1.500*	0.338	0.140	1.110	0.394	0.070	1.140	0.446	0.016	0.100	0.049	0.019	0.211	0.071	0.030	0.166	0.082
2-Methyl-2-Butene	0.110	1.230	0.361	0.110	1.320	0.364	0.060	*1.670*	0.442	0.012	0.154	0.064	bd	0.185	0.064	0.014	0.112	0.063
2-Methylbutane	bd			bd			bd			0.374	2.712	1.145	0.353	*5.783*	2.460	0.450	5.264	2.300
2-Methylheptane	0.090	0.800	0.247	0.080	0.770	0.285	0.070	*1.450*	0.513	bd	0.044	0.013	bd	0.092	0.039	0.010	0.084	0.038
2-Methylhexane	0.200	2.000	0.595	0.220	1.860	0.709	0.190	*3.550*	1.110	bd	0.184	0.069	bd	0.256	0.100	0.022	0.282	0.119
2-Methylpentane	0.530	5.650	1.652	0.770	4.920	1.988	0.840	*19.98*	5.565	0.054	0.432	0.196	0.045	1.020	0.349	0.058	0.910	0.343
3,6-Dimethyloctane	0.010	0.140	0.038	0.050	0.160	0.093	0.010	*0.210*	0.057	bd			bd	0.088	0.014	bd	0.120	0.032

Value in italics indicate the maximum 24-h average concentration measured

bd-Below Detection Limit

Table V: continued

Comparison of Fort Saskatchewan area survey VOC data to Year 2001 VOC data from Edmonton and Calgary																		
Location	Calgary Central			Edmonton Central			Edmonton East			Ft Sask area			Ft Sask area			Ft Sask area		
Time	2001 VOC			2001 VOC			VOC 2001			March 27 to May 26, 2002			June 1 to July 31, 2002			Aug 6 to 30, 2002		
Sample Type	24-h avg			24-h avg			24-h avg			24-h avg			24-h avg			24-h avg		
Compound (µg/m³)	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
3-Ethyltoluene	0.180	*2.640*	0.625	0.210	1.340	0.595	0.090	1.530	0.401	0.010	0.094	0.027	0.011	0.222	0.052	0.012	0.080	0.040
3-Methyl-1-Butene	0.040	*0.290*	0.080	0.030	0.190	0.076	0.020	0.230	0.094	bd	0.026	0.011	0.008	0.044	0.018	0.008	0.040	0.020
3-Methyl-1-Pentene	bd	0.100	0.043	bd	0.080	0.040	bd	*0.130*	0.043		bd		bd	0.021	0.005	bd	0.014	0.004
3-Methylheptane	0.070	0.760	0.225	0.070	0.750	0.254	0.060	*0.970*	0.330	bd	0.126	0.038	bd	0.081	0.039	0.028	0.088	0.054
3-Methylhexane	0.210	2.160	0.660	0.250	2.120	0.805	0.190	*3.360*	1.194	bd	0.176	0.071	bd	0.270	0.102	0.020	0.272	0.115
3-Methylpentane	0.380	3.820	1.088	0.470	3.320	1.319	0.480	*12.63*	3.157	0.062	0.366	0.178	0.056	0.831	0.305	0.060	0.792	0.333
4-Ethyltoluene	0.110	*1.280*	0.334	0.110	0.700	0.319	0.050	0.770	0.226	0.006	0.052	0.014	0.008	0.111	0.026	0.008	0.038	0.019
4-Methyl-1-Pentene	bd	0.110	0.041	bd	0.100	0.036	bd	*0.140*	0.043		bd		bd	0.006	0.001	bd	0.028	0.006
4-Methylheptane	0.030	0.330	0.099	0.030	0.310	0.115	0.030	*0.500*	0.178	bd	0.016	0.003	bd	0.023	0.010	bd	0.026	0.008
Acetaldehyde		bd			bd			bd		2.384	10.120	4.456	4.429	*32.63*	11.555	5.089	24.400	13.889
Acetone		bd			bd			bd		1.860	3.580	2.476	3.312	*9.610*	5.711	1.663	5.924	3.928
Acetylene	1.066	8.856	3.668	1.154	*11.55*	3.871	0.380	9.948	2.373	0.245	1.150	0.548	0.144	0.654	0.298	0.114	1.476	0.654
a-Pinene		bd			bd			bd		bd	0.148	0.037	0.046	*0.937*	0.436	0.038	0.734	0.292
Benzene	0.560	4.990	1.448	0.560	4.290	1.576	0.510	*5.080*	1.863	0.172	0.966	0.469	0.129	1.890	0.575	0.116	1.268	0.478
Benzyl Chloride	0.030	0.090	0.058	0.020	0.095	0.042	0.020	*0.100*	0.048	bd	0.008	0.001	bd	0.027	0.004	bd	0.008	0.003
b-Pinene		bd			bd			bd		bd	0.030	0.007	bd	*0.429*	0.117	bd	0.194	0.080
Bromodichloromethane	0.020	0.140	0.096	bd	*0.160*	0.089	bd	*0.160*	0.095		bd		bd	0.011	0.002	bd	0.010	0.004
Bromoform	0.010	*0.080*	0.054	0.030	*0.080*	0.049	0.020	0.070	0.048	0.006	0.016	0.011	0.008	0.023	0.012	0.012	0.022	0.014
Bromomethane	0.080	0.480	0.151	0.080	0.200	0.133	0.080	*0.650*	0.141	0.058	0.070	0.065	0.063	0.193	0.093	0.106	0.160	0.122
Bromotrichloromethane		bd			bd			bd			bd			bd			bd	
Butane	1.920	30.290	7.509	2.460	29.630	8.432	3.050	*117.4*	31.92	0.556	3.732	1.876	0.440	7.020	2.762	0.696	11.38	4.807
c-1,2-Dichloroethene	bd	*0.060*	0.035	0.010	0.050	0.034	bd	0.050	0.033		bd			bd			bd	
c-1,2-Dimethylcyclohexane	0.020	0.120	0.044	0.020	*0.160*	0.045	0.020	0.150	0.069		bd		bd	0.020	0.010	bd	0.022	0.008
c-1,3-Dichloropropene	bd	*0.020*	0.001	bd	*0.020*	0.001	bd	0.010	0.001		bd			bd			bd	
c-1,3-Dimethylcyclohexane	0.030	0.310	0.086	0.030	0.590	0.112	0.040	*0.790*	0.317	bd	0.036	0.017	0.011	0.075	0.032	0.010	0.062	0.029
c-1,4/t-1,3-Dimethylcyclohexane	0.010	0.150	0.042	0.010	*0.240*	0.048	0.020	0.210	0.088	bd	0.012	0.003	bd	0.012	0.004	bd	0.016	0.006
c-2-Butene	0.060	0.570	0.159	0.050	0.470	0.160	0.030	*0.580*	0.183	0.008	0.028	0.017	0.009	0.080	0.027	0.010	0.058	0.027
c-2-Heptene	bd	0.080	0.041	bd	0.080	0.036	bd	0.220	0.041	bd	*0.238*	0.064	bd	0.069	0.007	bd	0.090	0.055
c-2-Hexene	0.020	*0.200*	0.058	0.020	0.150	0.058	bd	0.150	0.056	bd	0.014	0.002	bd	0.008	0.004	bd	0.010	0.005
c-2-Pentene	0.070	*0.630*	0.171	0.050	0.450	0.167	0.030	0.590	0.207	bd	0.036	0.012	bd	0.076	0.028	0.008	0.070	0.034
c-3-Heptene		bd			bd			bd			bd		bd	0.038	0.011	bd	*0.042*	0.018
c-3-Methyl-2-Pentene	0.020	0.210	0.063	0.020	0.210	0.065	bd	*0.240*	0.064	bd	0.038	0.011	bd	0.030	0.010	bd	0.018	0.009
c-4-Methyl-2-Pentene	bd	0.060	0.009	bd	0.110	0.013	bd	*0.120*	0.010	bd	0.008	0.001	bd	0.010	0.003	bd	0.018	0.004
Camphene		bd			bd			bd		bd	0.082	0.022	0.022	*0.186*	0.066	0.010	0.096	0.040
Carbontetrachloride	0.530	0.780	0.655	0.530	0.810	0.642	0.530	*0.820*	0.640	0.588	0.710	0.653	0.619	0.696	0.656	0.616	0.672	0.638
Chlorobenzene		bd			bd			bd		bd	0.020	0.013	0.014	*0.034*	0.023	0.016	0.024	0.019
Chloroethane	0.040	0.160	0.071	0.060	0.140	0.096	0.030	0.170	0.066	0.020	0.144	0.098	0.103	*0.365*	0.212	0.094	0.270	0.148
Chloroform	0.090	*0.210*	0.131	0.080	0.150	0.117	0.070	0.180	0.104	0.056	0.108	0.076	0.090	0.090	0.067	0.052	0.092	0.068
Chloromethane	0.910	1.320	1.133	0.920	*1.340*	1.103	0.930	1.310	1.093	1.082	1.240	1.156	1.059	1.169	1.106	0.924	1.088	1.006
Cyclohexane	0.050	0.810	0.236	0.100	1.410	0.361	0.220	*7.640*	1.653	0.026	0.114	0.068	0.024	0.159	0.071	0.020	0.182	0.082
Cyclohexene	bd	*0.140*	0.049	bd	0.070	0.046	bd	0.080	0.042	bd	0.016	0.003	bd	0.008	0.002	bd	0.010	0.002
Cyclopentane	0.090	1.070	0.316	0.170	0.890	0.424	0.220	*7.710*	1.733	0.022	0.124	0.062	0.021	0.274	0.101	0.020	0.210	0.090
Cyclopentene	0.030	*0.340*	0.089	0.040	0.210	0.093	0.020	0.190	0.086	0.002	0.024	0.006	0.003	0.024	0.008	0.004	0.016	0.009
Decane	0.090	1.770	0.332	2.020	*3.810*	2.753	0.080	2.380	0.607	0.012	0.108	0.036	0.018	1.576	0.192	0.024	0.094	0.048
Dibromochloromethane	bd	*0.080*	0.058	0.020	*0.080*	0.054	0.020	*0.080*	0.051	bd	0.006	0.001	bd	0.008	0.001	bd	0.004	0.002
Dibromomethane	0.030	*0.130*	0.102	0.030	*0.130*	0.093	0.030	0.120	0.088		bd		bd	0.034	0.019	bd	0.064	0.031
Dichloromethane	0.210	3.180	0.499	0.230	*5.980*	0.730	0.180	2.260	0.466	0.172	0.312	0.218	0.134	0.256	0.173	0.118	0.206	0.150
Dodecane	0.030	0.640	0.178	0.060	0.390	0.178	0.030	*1.050*	0.318	0.026	0.216	0.079	0.034	0.262	0.069	0.020	0.052	0.037
Ethane	1.792	20.562	6.682	2.273	29.921	7.880	2.927	*35.64*	11.86	2.272	11.87	5.220	1.101	4.556	2.935	0.860	8.220	4.806
Ethanol		bd			bd			bd		2.61	38.75	23.62	33.33	*484.6*	109.8	69.77	133.0	89.25
Ethylbenzene	0.300	3.820	0.923	0.320	*7.940*	1.045	0.140	2.480	0.695	0.030	0.380	0.097	0.040	1.143	0.254	0.022	1.470	0.363
Ethylbromide	bd	0.050	0.031	bd	0.080	0.032	0.010	*0.150*	0.033	bd	0.008	0.006	0.006	0.034	0.014	0.010	0.020	0.012
Ethylene	1.552	12.660	4.041	1.400	13.165	4.591	0.578	*13.74*	4.105	0.300	2.552	0.978	0.346	4.033	1.219	0.288	3.491	1.539
Ethylene Oxide		bd			bd			bd			bd		bd	0.009	0.001	bd	*0.248*	0.050

Value in italics indicate the maximum 24-h average concentration measured

bd-Below Detection Limit

Table V: continued

Comparison of Fort Saskatchewan area survey VOC data to Year 2001 VOC data from Edmonton and Calgary																		
Location	Calgary Central			Edmonton Central			Edmonton East			Ft Sask area			Ft Sask area			Ft Sask area		
Time	2001 VOC			2001 VOC			VOC 2001			March 27 to May 26, 2002			June 1 to July 31, 2002			Aug 6 to 30, 2002		
Sample Type	24-h avg			24-h avg			24-h avg			24-h avg			24-h avg			24-h avg		
Compound (µg/m³)	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
Freon 11	1.320	*3.710*	1.812	1.370	1.980	1.690	1.290	2.320	1.670	1.714	1.856	1.776	1.714	1.852	1.773	1.724	1.770	1.742
Freon 113	0.570	0.820	0.720	0.620	0.960	0.805	0.590	*2.320*	1.391	0.616	0.664	0.634	0.570	0.660	0.636	0.622	0.646	0.628
Freon 114	0.130	0.280	0.223	0.150	0.290	0.213	0.140	*0.300*	0.208	0.110	0.140	0.115	0.106	0.116	0.112	0.110	0.114	0.112
Freon 12	2.190	*7.190*	2.996	2.220	6.200	3.058	2.120	3.460	2.731	2.568	2.724	2.629	2.562	2.904	2.707	2.612	2.704	2.657
Freon 22	0.580	*40.25*	1.612	0.510	3.530	0.897	0.480	1.590	0.636	0.484	0.986	0.570	0.473	0.596	0.537	0.518	0.752	0.596
Heptane	0.210	1.870	0.577	0.250	1.900	0.732	0.260	*7.020*	1.785	0.044	0.230	0.107	0.039	0.230	0.103	0.028	0.246	0.107
Hexachlorobutadiene	bd			bd			bd			bd	*0.002*	0.000	bd	0.001	0.000	bd		
Hexane	0.340	3.610	1.078	0.480	3.620	1.397	0.740	*25.55*	5.443	0.066	0.400	0.223	0.063	0.694	0.270	0.060	0.720	0.282
Hexylbenzene	bd	0.420	0.171	0.060	*0.550*	0.171	0.050	0.390	0.184	0.004	0.022	0.009	0.005	0.011	0.007	bd	0.006	0.004
Indan	0.050	*0.540*	0.136	0.050	0.280	0.130	0.030	0.260	0.095	0.002	0.078	0.016	bd	0.038	0.012	0.006	0.018	0.010
Isobutane	0.690	7.650	2.477	0.830	10.480	3.032	0.990	*30.48*	11.76	0.280	1.506	0.796	0.241	1.853	0.880	0.154	6.294	2.038
iso-Butylbenzene	0.010	*0.100*	0.036	0.020	0.060	0.039	0.010	0.070	0.035	bd	0.004	0.001	bd	0.009	0.002	0.002	0.004	0.002
Isoprene	0.080	1.500	0.341	0.100	3.520	0.411	0.030	5.470	0.510	0.008	0.282	0.065	0.237	*22.18*	5.289	0.390	8.908	3.124
iso-Propylbenzene	0.030	*0.220*	0.069	0.030	0.150	0.068	0.020	0.210	0.073	0.002	0.042	0.009	bd	0.027	0.008	0.002	0.020	0.008
Limonene	bd			bd			bd			bd	0.048	0.012	0.005	*0.085*	0.044	0.004	0.068	0.034
m,p-Xylene	1.030	13.430	3.241	1.040	*28.94*	3.604	0.400	8.430	2.327	0.060	0.634	0.182	0.072	0.547	0.229	0.058	0.602	0.268
Methyl Alcohol	bd			bd			bd			1.740	10.67	5.397	7.280	*25.58*	16.16	5.365	11.43	8.001
Methylcyclohexane	0.080	0.950	0.302	0.120	1.630	0.448	0.220	*6.900*	1.808	0.026	0.118	0.076	0.027	0.166	0.078	0.022	0.200	0.087
Methylcyclopentane	0.230	2.800	0.751	0.320	2.800	0.977	0.360	*9.800*	2.579	0.040	0.274	0.122	0.032	0.458	0.174	0.034	0.508	0.191
Methyl t-Butyl Ether (MTBE)	bd			bd			bd			bd			bd	*0.203*	0.020	bd	0.038	0.012
Naphthalene	bd	*2.760*	0.804	bd	1.780	0.582	bd	1.560	0.430	0.032	0.208	0.067	0.042	0.131	0.066	0.030	0.082	0.051
n-Butylbenzene	0.020	*0.240*	0.064	0.030	0.130	0.061	0.020	0.150	0.059	bd	0.010	0.006	bd	0.021	0.007	0.004	0.012	0.007
Nonane	0.060	0.890	0.206	0.090	0.840	0.273	0.070	*2.420*	0.619	0.022	0.144	0.049	0.017	0.262	0.062	0.022	0.092	0.044
n-Propylbenzene	0.060	*0.670*	0.180	0.080	0.350	0.176	0.040	0.500	0.153	0.006	0.034	0.013	0.009	0.093	0.025	0.006	0.048	0.021
Octane	0.070	0.910	0.244	0.090	1.230	0.302	0.100	*2.110*	0.710	0.032	0.152	0.071	0.032	0.115	0.067	0.026	0.116	0.062
o-Xylene	0.350	4.430	1.096	0.360	*8.560*	1.217	0.140	3.040	0.787	0.024	0.236	0.071	0.031	0.203	0.091	0.020	0.222	0.103
p-Cymene	0.020	0.470	0.121	0.030	0.280	0.107	0.030	*0.540*	0.151	bd	0.020	0.008	bd	0.036	0.016	0.008	0.018	0.012
Pentane	0.680	6.040	2.025	0.800	6.980	2.771	2.290	*136.2*	20.03	0.232	1.304	0.692	0.271	2.788	1.208	0.284	2.404	1.137
Propane	1.420	23.230	5.685	2.060	52.590	8.675	2.470	*184.7*	25.76	0.874	4.640	2.314	0.756	4.116	1.941	0.632	6.062	3.541
Propene	0.540	5.770	1.488	0.590	4.460	1.603	0.200	2.840	0.923	0.072	*6.262*	0.763	0.086	0.468	0.252	0.102	0.856	0.378
Propyne	bd			bd			bd			bd	*0.090*	0.017	0.003	0.048	0.019	0.008	0.064	0.030
sec-Butylbenzene	0.010	0.120	0.039	0.020	0.070	0.041	0.010	*0.130*	0.047	bd	0.004	0.001	bd	0.010	0.002	0.002	0.006	0.003
Styrene	0.050	0.760	0.179	0.050	0.660	0.214	0.030	*5.270*	0.618	0.008	0.108	0.041	0.010	1.455	0.280	0.016	0.272	0.092
t-1,2-Dichloroethene	bd	0.050	0.033	bd	0.050	0.030	bd	*0.070*	0.031	bd			bd	0.001	0.000	bd		
t-1,2-Dimethylcyclohexane	0.020	0.230	0.058	0.020	0.510	0.081	0.030	*0.570*	0.238	bd	0.014	0.001	bd	0.024	0.009	bd	0.032	0.013
t-1,3-Dichloropropene	bd	*0.030*	0.010	bd	*0.030*	0.010	bd	*0.030*	0.011	bd			bd			bd		
t-1,4-Dimethylcyclohexane	0.010	0.140	0.040	0.020	0.260	0.054	0.020	*0.380*	0.145	bd	0.014	0.008	0.003	0.020	0.009	0.002	0.022	0.010
t-2-Butene	0.060	*0.620*	0.168	0.040	0.490	0.169	0.040	*0.620*	0.189	bd	0.028	0.013	0.006	0.070	0.020	0.006	0.054	0.025
t-2-Heptene	bd	0.070	0.027	bd	*0.080*	0.025	bd	0.060	0.022	bd	0.006	0.001	bd	0.008	0.002	bd	0.006	0.001
t-2-Hexene	0.030	*0.290*	0.072	0.020	0.200	0.073	0.020	0.190	0.075	bd	0.020	0.006	bd	0.025	0.010	bd	0.020	0.008
t-2-Octene	bd			bd			bd			bd	0.010	0.001	bd	*0.074*	0.008	bd	0.072	0.017
t-2-Pentene	0.090	*1.000*	0.241	0.080	0.630	0.236	0.050	0.870	0.303	0.008	0.056	0.022	bd	0.219	0.059	0.014	0.112	0.060
t-3-Heptene	bd	*0.090*	0.026	bd	0.060	0.024	bd	0.050	0.020	bd			bd	0.006	0.001	bd		
t-3-Methyl-2-Pentene	bd	*0.220*	0.064	0.020	0.200	0.069	bd	*0.220*	0.064	bd	0.020	0.002	bd	0.013	0.004	bd	0.016	0.006
t-4-Methyl-2-Pentene	bd	0.030	0.004	bd	0.030	0.004	bd	*0.040*	0.004	bd	0.028	0.005	bd	0.002	0.000	bd		
tert-Butylbenzene	bd	0.070	0.022	bd	0.040	0.027	bd	0.100	0.023	bd	0.126	0.043	bd	*0.335*	0.094	0.050	0.258	0.149
Tetrachloroethene	0.160	*2.070*	0.629	0.130	1.030	0.351	0.080	1.130	0.284	0.032	0.098	0.047	0.020	0.079	0.041	0.016	0.090	0.038
Toluene	0.990	15.560	3.952	1.280	*25.07*	4.446	0.630	9.470	3.259	0.138	0.796	0.324	0.183	1.108	0.543	0.114	1.330	0.540
Trichloroethene	0.050	4.850	0.237	0.040	0.630	0.114	0.030	*6.970*	0.393	0.016	0.036	0.024	0.019	0.181	0.066	0.044	0.172	0.083
Undecane	0.070	1.170	0.240	0.240	0.720	0.441	0.050	1.520	0.383	0.020	0.164	0.056	0.033	*2.524*	0.303	0.028	0.086	0.046
Vinylchloride	bd	0.030	0.021	bd	0.080	0.024	0.010	0.070	0.025	bd	0.264	0.069	bd	0.130	0.057	bd	*0.266*	0.063

Value in italics indicate the maximum 24-h average concentration measured

bd-Below Detection Limit

Figure 1: Industrial facilities to the north-east of Edmonton

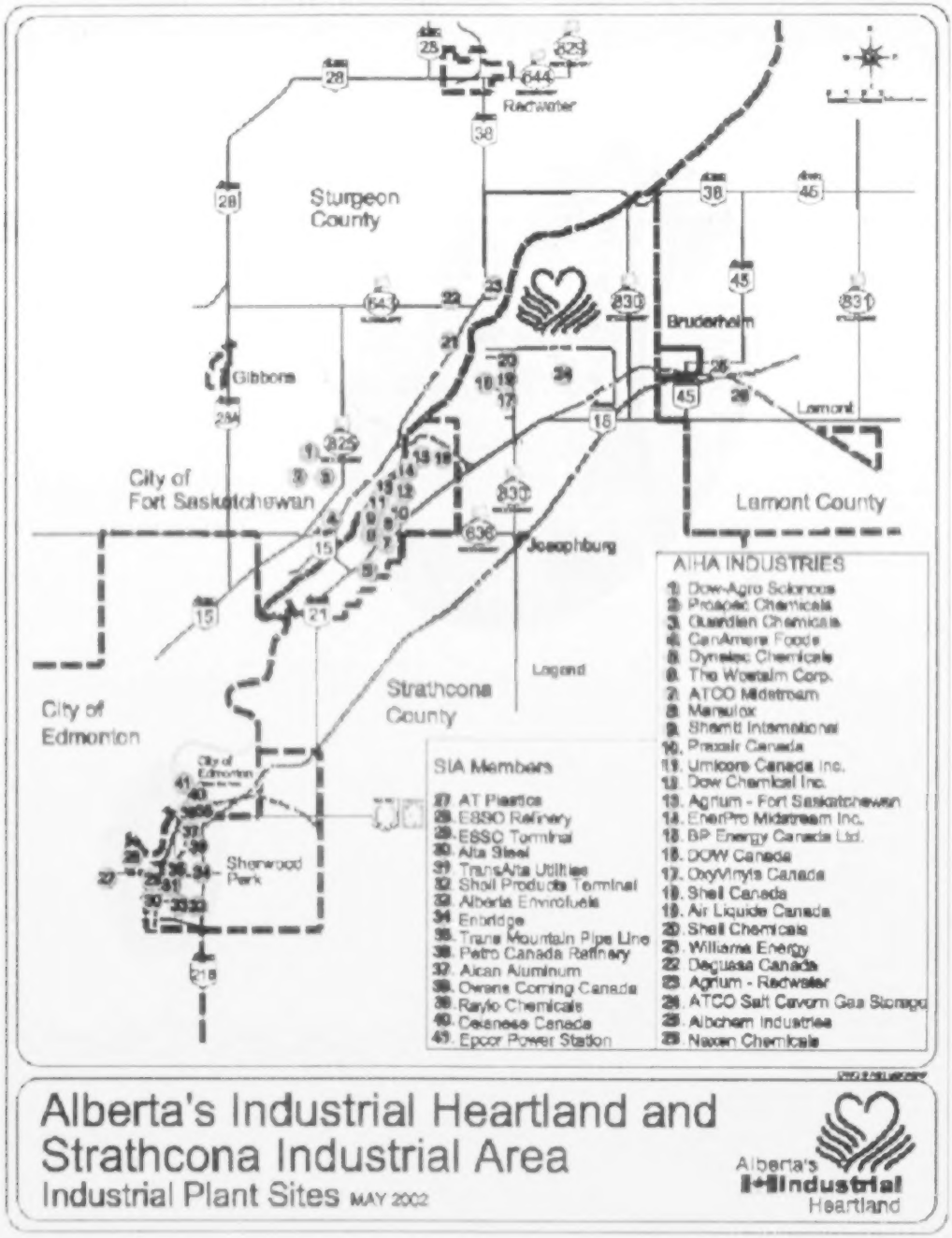

Figure I: Industrial facilities to the north-east of Edmonton